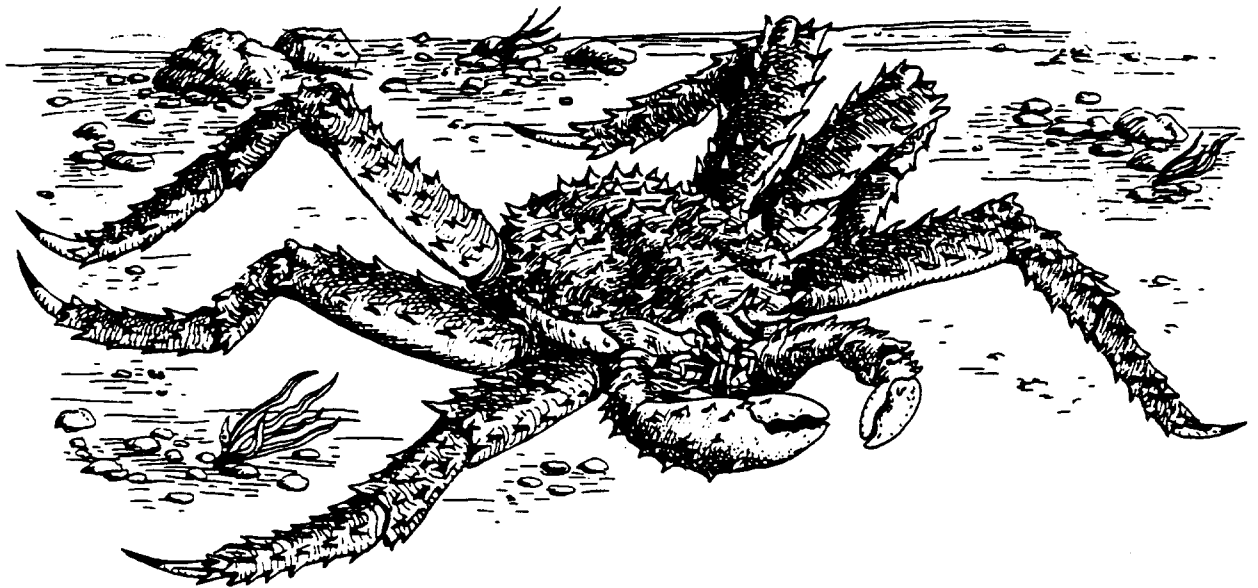


# REPORT TO THE BOARD OF FISHERIES

## SOUTHEAST ALASKA AND YAKUTAT (REGION I) 1987/1988 SHELLFISH FISHERIES



Regional Information Report No. 1J88-6

Prepared By:

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Juneau, Alaska  
April 1988

REPORT TO THE BOARD OF FISHERIES  
SOUTHEAST ALASKA (STATISTICAL AREA A)  
AND  
YAKUTAT (STATISITCAL AREA D)  
MICELLANEOUS SPECIES  
1987 / 1988

By  
Timothy Koeneman

Southeast Region  
Alaska Department of Fish and Game  
Division of Commercial Fisheries

April 1988

## TABLE OF CONTENTS

|  | <u>Page</u> |
|--|-------------|
| STATISTICAL AREA A (SOUTHEAST ALASKA-YAKUTAT) INTRODUCTION .....             | 1.0         |
| STATISTICAL AREA A (SOUTHEAST ALASKA-YAKUTAT) KING CRAB .....                | 2.0         |
| STATISTICAL AREA A (SOUTHEAST ALASKA-YAKUTAT) TANNER CRAB .....              | 3.0         |
| STATISTICAL AREA A (SOUTHEAST ALASKA-YAKUTAT) DUNGENESS CRAB .....           | 4.0         |
| STATISTICAL AREA A (SOUTHEAST ALASKA-YAKUTAT) SHRIMP .....                   | 5.0         |
| STATISTICAL AREA A (SOUTHEAST ALASKA-YAKUTAT) MISCELLANEOUS<br>SPECIES ..... | 6.0         |

REPORT TO THE BOARD OF FISHERIES  
SOUTHEAST ALASKA (STATISTICAL AREA A)

AND

YAKUTAT (STATISITCAL AREA D)

INTRODUCTION

1987 / 1988

By

Timothy Koeneman

Southeast Region  
Alaska Department of Fish and Game  
Division of Commercial Fisheries

April 1988

## INTRODUCTION

Statistical Area A encompasses all waters surrounding the Alexander Archipelago and the outer coastline northwest to Cape Fairweather. Statistical Area D encompasses waters from Cape Fairweather to Cape Suckling. Southeast Alaska and Yakutat waters have been exploited by a broad range of diversified shellfish fisheries utilizing methods from hand-picking with diving gear to ring nets, pots, trawls, and dredges. During the last completed fishery, on either a season or calendar year basis, the significant fisheries resulted in a harvest of 11.2 million pounds worth an estimated \$17.6 million to the fishermen involved.

Many of the fisheries are in a fairly advanced stage of development, many important fisheries have been stressed by high effort levels, and a few are in the rebuilding stages. In response to the limits of harvest these resources can reasonably sustain, regulations have become more restrictive since the early 1970's. However, in some fisheries, it does not appear as if management has been adequately conservative or responsive. During the past six seasons effort levels have in many fisheries increased significantly, and it appears that this trend is likely to continue into the future. Many representatives of the fishing industry, and representatives of the public are concerned about stock conditions, future fishery potentials, and future sport and subsistence harvests. These concerns are evident in some of the regulatory proposals for your consideration.

Shellfish research projects utilized to determine stock condition or to gain necessary biological information relative to Region 1 shellfish fisheries are limited in scope and number. An annual index of abundance survey has been accomplished on major red king crab stocks within the northern portion of Southeast Alaska. A pink and sidestripe shrimp population estimate was accomplished biennially in Yakutat Bay through 1984. Important fishery information is obtained on a regular basis for most fisheries from the

dockside sampling and skipper interview program. Some tanner crab information has been collected in conjunction with the red king crab index abundance survey. Some spot shrimp data is being collected by dockside catch sampling. Some pink shrimp data is being collected and analyzed through on-board and dockside catch sampling. Dockside catch and a limited amount of on-board sampling is important to informational needs in the dungeness crab fisheries. Some information relative to the miscellaneous species has been collected. This includes density and size frequency information for abalone, and population estimates for geoduck beds. Additional projects have been proposed to gather information in the brown king crab, Tanner crab, shrimp trawl, shrimp pot and miscellaneous fisheries. To date, it does not appear as if those projects will be funded.

Management, to some degree, is conducted in all fisheries within staff and funding limits. In those fisheries with available research data and harvest data, concise management plans and management strategies are developed. In others, management is limited to an analysis of historic fishery information, published information related to the species, current effort levels, current market conditions, and in-season harvest data. Management is usually limited to identification of serious problems or stock condition declines only after the condition has persisted. Management often entails reacting to problems as appropriately and as quickly as possible.

Staff members whose normal full-time assigned duties relate directly to shellfish fisheries include: Tim Koeneman, Region 1 Shellfish Biologist located in Petersburg; Cathy Botelho, 10 month shellfish Fishery Biologist I located in Douglas; and Ken Imamura, Assistant Area Management Biologist with duties related to Tanner and dungeness crab for approximately 6 months, located in Douglas; and Rexanne Eide, Fisheries Technician II port sampler for 8 months, located in Petersburg.

Staff assistance is received from: Paul Larson, Region 1 Fisheries Coordinator, located in Douglas; Marianna Alexandersdottir, Biometrician II, located in Douglas; Don House, Assistant Area Management Biologist in

Ketchikan; Dennis Blankenbeckler, Herring Project Leader Fishery Biologist III located in Ketchikan; and other regional and area staff members.

The king crab and shrimp reports under this cover were written by Tim Koeneman, the Tanner and dungeness reports were written by Ken Imamura. The miscellaneous species report was coauthored by Ken Imamura, Cathy Botelho, and Don House. Cathy Botelho completed the major portion of the tables and data summaries.

Table 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) list of fisheries, harvest and approximate ex-vessel values from the last completed season or calendar year.

| Season<br>or Year  | Fishery                                 | Harvest in<br>Thousands<br>of Pounds | Approximate Ex-<br>vessel Value in<br>Thousands of \$\$\$ |
|--|---|--------------------------------------|---|
| 1987/88  | Red & Blue King Crab                    | 1.5                                  | 5.7   |
| 1987/88  | Brown King Crab<br>(Season in Progress) | 648.6                                | 2,432.3   |
| 1987/88  | SE Tanner Crab                          | 1,306.2                              | 6,324.9   |
| 1987/88  | Yakutat Tanner Crab                     | *                                    |   |
| 1987/88  | SE Dungeness Crab                       | 3,314.4                              | 3,679.0   |
| 1987/88  | Yakutat Dungeness Crab                  | 2,714.5                              | 2,986.0   |
| 1987/88  | Shrimp Beam Trawl                       | 1,748.2                              | 437.1   |
| 1987   | Shrimp Otter Trawl                      | *                                    |   |
| 1987   | Pot Shrimp                              | 314.6                                | 964.8   |
| 1987/88  | Abalone                                 | 67.6                                 | 321.2   |
| 1987   | Weathervane Scallops                    | *                                    |   |
| 1987   | Sea Urchins                             | 653                                  | 98.3  |
| 1987   | Octopus                                 | 17.3                                 | 21.6  |
| 1987   | Geoduck                                 | 28.2                                 | 8.5   |
| 1987   | Sea Cucumbers (No. of)                  | 80.6                                 | 8.1   |
| Combined value of Yakutat Tanner crab,<br>scallop , and otter trawl shrimp |   |                                      | 361.9   |
| Value of Other Fisheries   |   |                                      | 17,287.5  |

\* Information is confidential because 3 or fewer vessels participated.



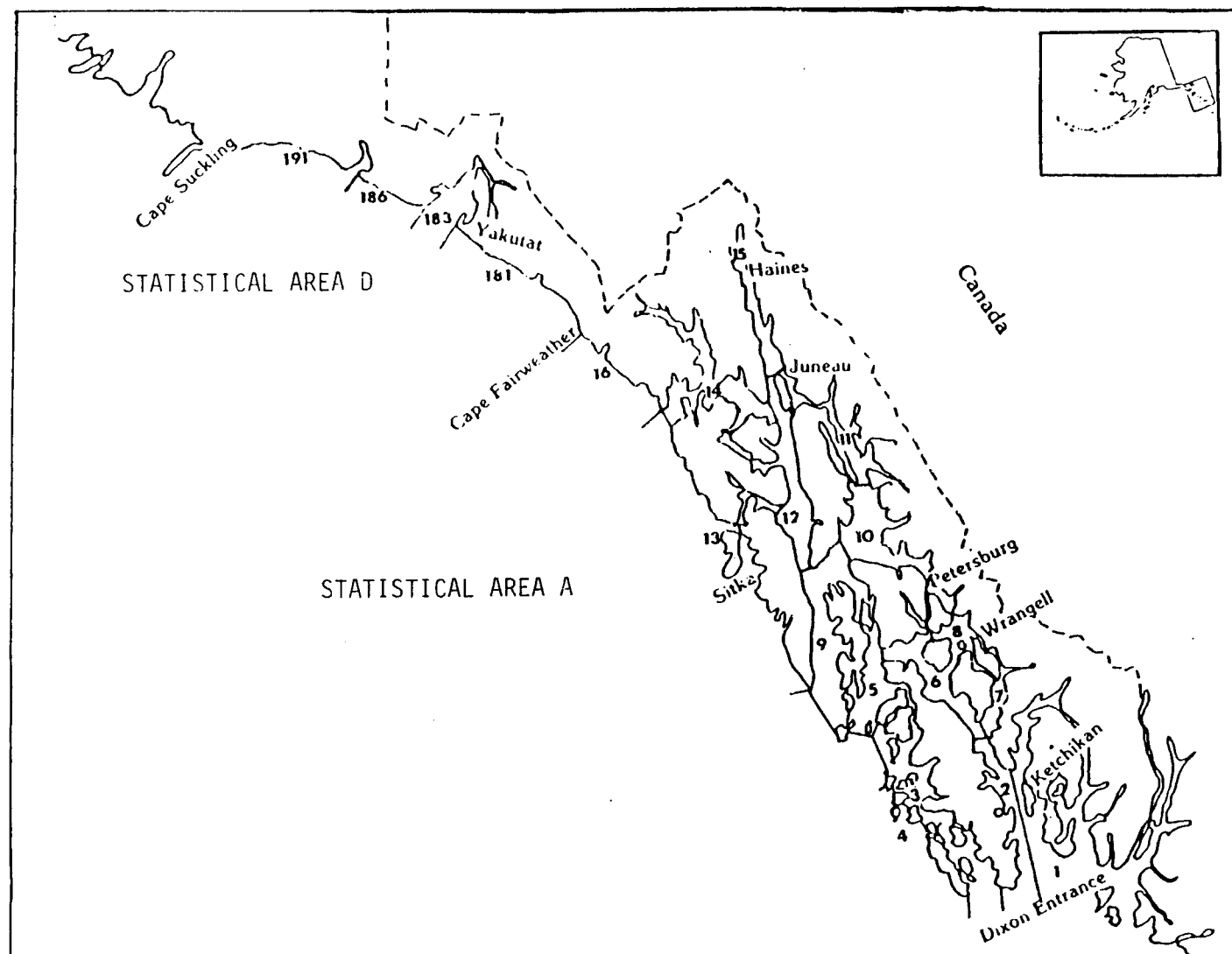


Figure 1. Map of Statistical Area A (Dixon Entrance to Cape Fairweather) and Statistical Area D (Cape Fairweather to Cape Suckling).

REPORT TO THE BOARD OF FISHERIES  
SOUTHEAST ALASKA (STATISTICAL AREA A)  
AND  
YAKUTAT (STATISITCAL AREA D)  
TANNER CRAB  
1987 / 1988

By  
Ken Imamura

Southeast Region  
Alaska Department of Fish and Game  
Division of Commercial Fisheries

April 1988

## TABLE OF CONTENTS

|                                   | <u>Page</u> |
|-----------------------------------|-------------|
| BACKGROUND .....                  | 2.3         |
| Red and Blue King Crab .....      | 2.4         |
| Brown King Crab .....             | 2.5         |
| SEASON SUMMARY .....              | 2.6         |
| Red and Blue King Crab .....      | 2.6         |
| Brown King Crab .....             | 2.8         |
| FUTURE SEASON PROJECTIONS .....   | 2.11        |
| Red King Crab .....               | 2.11        |
| Blue King Crab .....              | 2.12        |
| Traditional Brown King Crab ..... | 2.12        |
| Exploratory Brown King Crab ..... | 2.14        |

## LIST OF TABLES

| <u>Table</u>   | <u>Page</u> |
|--|-------------|
| 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) king crab harvest by species, number of landings and number of vessels by year, 1960 to present .....  | 2.15        |
| 2. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) red and blue king crab harvest in thousands of pounds by month and season, 1972/73 to present .....    | 2.16        |
| 3. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) red and blue king crab harvest in thousands of pounds by district and season, 1970/71 to present ..... | 2.17        |
| 4. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) summary of red king crab samples of commercial landings by age/size/class, 1968 to present .....       | 2.18        |
| 5. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) brown king crab harvests in thousands of pounds by month and season, 1972/73 to present .....          | 2.19        |
| 6. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) brown king crab harvests in thousands of pounds by district and season, 1972/73 to present .....       | 2.20        |
| 7. Statistical Area A (Southeast Alaska) summary of brown king crab dockside samples from 1970/71 to present .....   | 2.21        |
| 8. Statistical Area A (Southeast Alaska) comparison of historic red king crab indexing data 1979 to present .....  | 2.22        |
| 9. Statistical Area A (Southeast Alaska) summary of standardized red king crab index data in percent by size/age class, 1979 to present .....                                    | 2.23        |
| 10. Statistical Area A (Southeast Alaska) comparison of standardized index data and commercial sampling data of red king crab, 1979 to present .....                             | 2.24        |

## BACKGROUND

Commercial king crab fishing in Southeast Alaska was initially documented in 1960 when a small harvest occurred in the Petersburg-Wrangell Management Area. During the early development period, from 1961 through 1968, regulations provided for a male only fishery, a minimum legal size of 6.5 inches in carapace width, and no closed season. In 1968 a pot limit of 40 pots per vessel was established for Southeast Alaska waters. During this period of time, harvests averaged 1.1 million pounds from less than 10 vessels per season.

Prior to the 1969/70 season, the minimum legal size was increased to 7.0 inches, a closed season from March 16 to August 14 was established, and pot storage in the water was allowed. In 1970 an quota of 1.5 million pounds was provided for all combined king crab species. The first emergency order was issued in January, 1971 when the harvest for the 1970/71 season totaled only 221,000 pounds after 4.5 months of fishing. In 1971 separate red and blue, and brown king crab fisheries were recognized with the adoption of distinct seasons and quotas. Seasons have been altered since that time, and guideline harvest ranges (GHR's) replaced quotas.

With the decline of the larger king crab fisheries in Western Alaska, increased fishing pressure occurred in the Southeastern Alaska king crab fisheries. Management of separate species and stocks presently occurs. Fish ticket data prior to 1976 did not identify the species of king crab landed. However, area management reports do allow an estimation of the species composition of the total harvest. Effective January 1, 1985 a limited entry program was provided for the king crab and tanner crab fisheries in Southeast Alaska by the Alaska Commercial Fisheries Entry Commission, with maximum transferable effort levels of 61 vessels for the red and blue king crab fishery, and 57 vessels for the brown king crab fishery. Additional effort will be present in all king crab fisheries due to the issuance of non-transferable permits. At this time, the number of non-transferable permits is not

known. Since the implementation of a moratorium on limited entry by pots, an increase in the use of ring net gear has occurred in the fishery.

### Red and Blue King Crab

Red and blue king crab, (*Paralithodes camtschatica*), and (*P. platypus*), are primarily harvested in the protected bays, inlets, and adjacent shorelines of the northern waters of Southeast Alaska at depths of less than 150 fathoms. Both standard side-loading king crab pots and top-loading Tanner crab pots are utilized in the fishery. Important red king crab fishing grounds are located in bays which open into Frederick Sound, Stephens Passage, Seymour Canal, Icy Straits, and Peril Straits. Red king crab are the target species, with small quantities of blue king crab harvested as an incidental species. Since the 1970/71 season, harvests have averaged 436,000 pounds, with an average of 35 vessels participating in the fishery each season. This represented an approximate ex-vessel value of \$375,000.

With the exception of an increase from 40 to 60 pots, and finally to 100 pots, regulations have gradually become more restrictive. The fishing season of September 1 through January 31 was established to provide a closure during a portion of the congregation period, the molting and mating season, and the major growth period, after which recovery rates would be acceptable to industry. Industry proposals in recent years have resulted in a later opening date in an attempt to further optimize meat yield or shell fullness. The minimum legal size remains at seven inches of carapace width, with provisions for an eight inch season by emergency order if warranted by biological conditions and consistency with Board of Fisheries policy. Beginning in 1971, separate red and blue, and brown king crab GHR's have been established based upon historic harvest information. Since the 1979/80 season, management has been based upon results of an annual red king crab stock index-of-abundance research survey. If the season is opened, the survey information is utilized to set the appropriate harvest level within

the published GHR. Intensification of fishing effort, and additional effort entering the fishery, in combination with declining stock conditions has resulted in season closures considerably earlier than the regulation closure dates during recent seasons. In response to more restricted red king crab fishing seasons, exploratory blue king crab fishing opportunities in certain locations have been provided beginning with the 1983/84 season. These locations are Glacier Bay, Upper Lynn Canal, Taku Inlet, Port Snettisham, and Holkham Bay.

### Brown King Crab

Brown king crab, (*Lithodes aequispina*), are harvested from deeper waters of the more exposed portions of straits and sounds of the inside waters of Southeast Alaska, generally at depths greater than 100 fathoms but less than 350 fathoms. Important fishing grounds are located at the confluences of Icy Straits and Lynn Canal and Chatham Straits, in Chatham Straits, and in Stephens Passage and Frederick Sound. This fishery is somewhat more rigorous than the red king crab fishery due to the factors of depth, tide, current, and weather. Brown king crab were undoubtedly harvested in significant quantities prior to the 1969/70 season, but to what degree has not been documented. Since the 1970/71 season, harvests of brown king crab have averaged approximately 340,000 pounds per season. This average harvest had an ex-vessel value of approximately \$150,000 per season. Until recently, few vessels participated in this fishery on a regular basis.

From 1969/70 through 1973/74 seasons, brown king crab were regularly harvested from the fishing grounds mentioned above. From 1974/75 through 1979/80 seasons, the fishery was primarily conducted in the Frederick Sound and Stephens Passage grounds. Since the 1980/81 season renewed effort for brown king crab developed in other fishing locations. Recent harvests and ex-vessel values have been considerably higher than the long-term averages since 1970/71.

Regulation development in the brown king crab fishery has generally paralleled that in the red king crab fishery, with the exception that the original 1971/72 season of August 1 through March 31 has been gradually lengthened to a 12 month season with special permits issued for the May 1 through September 30 time frame. The special permit provision has not been in effect since the spring 1983 Board of Fisheries meeting. GHR's have been determined using historic harvest information in this fishery. In recent years, the target harvest level within the published GHR has been strongly influenced by population structure information obtained from dockside sampling. During recent seasons an exploratory fishery in fishing locations with relatively low historic harvests of brown king crab has been provided when the traditional fishing locations have been closed.

## SEASON SUMMARY

### Red and Blue King Crab

The red king crab fishery in Southeast Alaska was scheduled to open by regulation on November 15, 1987. This fishery remained closed for the 1987/88 season, based upon information collected during the 1986 and 1987 red king crab stock index of abundance research surveys. This information indicated no change in stock status. Any opening would have been very short and limited in geographical area, considering the fleet size and fishing power.

The 1986 survey utilized improved survey design and analytical techniques and included all major areas surveyed since 1979. Improved survey design and techniques were initiated to increase the precision of estimates derived from survey data, and to better survey areas where crab had occurred during past surveys. Survey data were standardized to a 24-hour soak period, and bay



data was weighted by bay area. In addition, previous survey data from 1979 through 1985, were treated in the same manner to provide a time series for comparison.

The same techniques and methodology were utilized in 1987. Insufficient funds for surveying all major areas in 1987, resulted in a partial survey. Major bays surveyed included Pybus Bay, Deadman's Reach, Excursion Inlet, Eagle River, and Barlow Cove. These locations were chosen to provide an opportunity to assess good areas (Deadman's Reach and Barlow Cove), relatively poor areas with good potential for stock improvement (Excursion Inlet and Eagle River) and a severely depressed area (Pybus Bay). In addition, these locations and adjacent fishing areas provide a significant portion of the commercial harvest during a normal fishing season. A fall survey was conducted in October 1987, to assess any difference in distribution or abundance in Pybus Bay, Deadman's Reach, and Barlow Cove.

Results of the survey and subsequent analysis of data from 1979 through 1986 indicated that the abundance of legal male red king crab remained depressed. The catch per pot for legal males was 2.22 in 1986 compared to 2.32 in 1985 and a high of about 4.00 in 1979. Additionally, the distribution of crab within the legal population had gradually declined from 67% recruits and 33% post-recruits in 1981 to 47% recruits and 53% post-recruits in 1986. This indicated a trend of declining recruitment into the fishery during the previous six seasons, which viewed with the pre-recruit data is not encouraging.

The abundance of young male crab (pre-recruits) which would be expected to recruit into the fishery in the near future was also low. The catch per pot for all pre-recruit male crab was 9.70 in 1986, compared to 6.08 in 1985 and a high of 23.96 in 1979. The slight improvement seen in pre-recruit abundance from 1985 to 1986 can be attributed to an improvement in the abundance of young male crab that are still 2 to 4 years from reaching minimum legal size. However, this slight improvement was seen in only a single small bay area, Barlow Cove. In the remaining bay areas surveyed each year, the number of pre-recruit male crab continues to be depressed.

The same trend was evident in the female population segment. In all areas the adult female abundance continued to be depressed at the level it has been for four years. With the exception of improvements in the juvenile female segment in Barlow Cove, the adult and juvenile female segments appeared depressed in all other bay areas surveyed each year.

Data from the partial surveys in 1987 showed no significant improvements, when compared to 1986 data for the bays surveyed. In addition, there were no significant differences between the summer and fall surveys, with the exception of Barlow Cove. In Barlow Cove, it appears that the summer survey did not adequately sample the available population. Results from the fall survey in Barlow Cove were very similar to the summer 1986 data, with respect to population structure and abundance.

Blue king crab fishing opportunities were provided by emergency order in portions of districts 11, 14, and 15 on January 15, 1988. Locations opened to fishing included Holkham Bay, Port Snettisham, Taku Inlet, upper Lynn Canal, and Glacier Bay. This season was closed simultaneously with the Tanner crab fishery on February 16, 1988. Twenty vessels made 36 landings totaling about 1,400 pounds. Most of the landings included small quantities of blue king crab that were captured incidentally to directed fishing for Tanner crab and brown king crab.

#### Brown King Crab

The 1987/88 exploratory brown king crab fishery was opened on February 24, 1987 in: Districts 1 through 5; District 6 south of the latitude of Point Alexander; District 7; District 9, only those waters of Chatham Strait south and west of a line from Point Gardner light to Kingsmill Point light; sections 13-A and 13-B of District 13; District 16; the Yakutat Area, and the seaward biological influence zone out to a depth of 800

fathoms. On August 31, 1987 the boundary in District 9 was changed to include only those waters of Chatham Strait south of the latitude of Point Sullivan. This fishery continued until the regulatory closure time of December 29, 1987.

A maximum of nine vessels participated in the fishery during any one month that the season was opened. The total harvest of 316,059 pounds occurred from 95 landings. Although a sizable fishing area was opened, the great majority of the harvest was taken in waters adjacent to the line from Kingsmill Point to Point Gardner. The fishery was open for 10 months, and more than 68% of the harvest was taken from March through June. Catches from July through December totaled 99,508 pounds and were fairly evenly distributed between those months. Harvests from districts south of Petersburg were very limited.

The 1987/88 traditional brown king crab fishery opened by regulation, simultaneously with the Tanner crab season on January 15, 1988. A news release dated December 28, 1987 described the management strategy for brown king crab during the 1987/88 season. The management strategy is intended to spread fishing effort to more segments of the stocks available for harvest while minimizing the possibility of overexploitation of those segments which are heavily fished. Additionally, it incorporates grounds fished in previous exploratory fisheries into the traditional fishery. Staff has submitted a proposal to describe this new management strategy in the regulatory booklet. This new management strategy established four harvest areas, each with a separate harvest limit based upon historic long and short term average harvests. The areas and GHRs are: (1) Frederick Sound-Stephens Passage, 200,000 to 325,000 pounds; (2) Icy Straits-Upper Chatham Straits-Lynn Canal, 150,000 to 250,000 pounds; (3) Lower Chatham Straits, 200,000 to 250,000 pounds; and (4) Exploratory Area (all other waters), no fixed GHR established.

Initial overflights of the traditional fishery indicated that a large portion of the brown king crab fleet was concentrated in the Frederick Sound-Stephens

Passage area. Harvests were tracked through close cooperation between the Department and industry. After approximately one-half of the vessels targeting on brown king crab landed, the average harvest of 14,200 pounds was utilized to extrapolate an approximate total harvest of 202,000 pounds by January 27, 1988. At that harvest rate, it was estimated that an additional seven days of fishing would be required to reach the high figure of the GHR of 325,000 pounds. On January 27, 1988 a February 3 closure was announced the Frederick Sound-Stephens Passage area. Preliminary fish ticket data indicates that 17 vessels targeted on brown king crab in this area, with a resulting harvest of 396,513 pounds. Dockside sampling information indicates that the average carapace length of landed crab was 173.5 mm, which is the largest average size since the 1981/82 season. Average weights from most landings were also higher. Fishing was reported to be good at the closure time in some portions of the area.

After the Frederick Sound-Stephens Passage area was closed, many fishermen ceased fishing. Little effort moved into the areas which remained open. Fishing in portions of the Icy Straits-Upper Chatham Straits-Lynn Canal was reported to be slow. As of March 24, 1988 the harvest in this area was approximately 114,614 pounds. Effort in the Lower Chatham Straits area was also low and the resulting harvest in this area was 131,946 pounds on the same date. These locations remain open at this time.

Ex-vessel prices were as high as \$3.60 per pound during the traditional fishery. The current total harvest of 643,073 pounds had an ex-vessel value of approximately \$2,315,000 to the fleet involved. It is likely that an additional 200,000 pounds will be landed from the traditional fishery by the end of the season.

## FUTURE SEASON PROJECTIONS

### Red King Crab

Primary information utilized to project abundances during future seasons is the data resulting from red king crab stock index of abundance research surveys, fish tickets, dockside samples, and skipper interviews.

Existing data from research surveys indicates that improvements in all segments of red king crab stocks in major fishing locations would have to be substantial before a commercial fishery would be appropriate in all stock locations. Substantial overall improvement is not likely to occur for approximately 2 to 4 years, and low levels of adult females may be indicative of low larval production for an additional period of time. Low larval production may inhibit stock increases in some locations.

It is not possible, with the available information, to fully determine the causative factors which have led to the present red king crab stock conditions in Southeast Alaska. In all probability, it is a combination of natural and fishery induced causes. There may be additional steps that can be implemented to reduce the effects caused by the fishery. Studies could be undertaken to determine the proper mesh size and fishing techniques to minimize the by-catch of non-legal crab and the fishing industry could be encouraged to use the most appropriate fishing methods and techniques.

Funds will be available to conduct a complete red king crab survey and to reassess stock condition for the 1988/89 season. Funds may also be available to assess the effects of some current fishing techniques on the non-legal portion of the stocks.

Available information suggests that stocks in a few bay areas are sufficiently strong to permit a limited harvest during the 1988/89 season. However,

stocks in many other historically productive areas remain severely depressed. In order to allow harvest of stronger stocks future management of this fishery will necessitate a different strategy from that employed to date. Bay closures for stocks in poor condition will be necessary. In addition, closure of areas with known concentrations of non-legal crab will be considered. Additionally, a red king crab season combined with other species (brown and blue king crab, and Tanner crab) may serve to reduce the directed fishery on red king crab. If possible, species specific mesh requirements could be implemented to reduce the effects of fishing on the non-legal portion of the stocks.

### Blue King Crab

The fishing opportunities for blue king crab during the last three seasons have not appeared to identify stocks of sufficient size to warrant a significant directed fishery on this species given present biological information and minimum legal size. Stocks in many glaciated areas, which is a primary blue king crab habitat type, have been reported to be heavily infested with a parasitic barnacle, (*Briarosaccus callosus*), that drastically reduces stock reproduction, growth, and maximum size. These negative effects may tend to prevent the development of large stocks of blue king crab. However, management considers it possible to maintain a small fishery in certain locations in conjunction with other king and Tanner crab openings without significant impacts on these stocks. Future management might consider taking any infected blue king crab in an attempt to reduce the infection rate in the population and thereby increase stock reproduction, growth, and abundance.

### Traditional Brown King Crab

Research projects to investigate various biological parameters, distribution, and abundance have not been established. Commercial fishery harvest data can

be utilized as an indication of stock strength. Harvests from waters of grounds other than the Frederick Sound-Stephens Passage complex are small compared to historic averages. In addition to the increased dependency upon the Frederick Sound-Stephens Passage stocks, the fishery has been dependent upon the recruit size crab during some seasons. Crab landed during the previous five seasons have all averaged below 170 mm in carapace length and average weight per landed crab was low. Specific landings with average weights below six pounds per crab have occurred during past seasons. However, average carapace length and average weight were higher during the 1987/88 traditional brown king crab fishery in Frederick Sound-Stephens Passage. It appears that the smaller crab landed during previous seasons may have represented a fishery based on recruit classes. Small crab noted during the 1984/85 through 1986/87 seasons have now grown and fully recruited into the fishery with significant strength. During the 1970/71 through 1975/76 period, larger crab represented the greater proportion of landed crab. Data from 1987/88 suggests that this trend will repeat itself. However, it must be remembered that effort and resulting harvests were much lower during the earlier fishing seasons.

A conservative approach must be taken towards the management of this fishery with the present effectiveness of the fishing fleet. It is essential that management orient towards "stocks" rather than a general statistical area approach. This will require additional biological information and altered fishing patterns. Care must be taken to identify strong recruit classes when they enter the fishery and attempt to hold a portion of these classes for future fishing seasons.

As previously mentioned, biological information necessary for rational resource management of this species is not currently available. If management of this fishery does not become more conservative, then it is possible that the fishery will falter when the next recruit class fails to appear.

Data currently available indicates that the Frederick Sound-Stephens Passage stock appears healthy. It is possible that a harvest reaching or exceeding

the upper portion of the GHR is appropriate next year. Data from the Icy Straits-Upper Chatham Straits-Lynn Canal stock has not recovered from extensive fishing during the 1980/81 through 1983/84 seasons and a harvest in the mid-range of the GHR is appropriate next year. At this time, it may be too early to determine an appropriate harvest level for the Lower Chatham area. All areas combined could be expected to produce a total brown king crab harvest of approximately 900,000 pounds next season.

### Exploratory Brown King Crab

During the past exploratory brown king crab fishery, effort concentrated on the Point Gardner to Kingsmill Point line. Brown king crab have been found in areas south of the current line at the latitude of Point Sullivan. Fishing conditions are more rigorous in the southern portion of Chatham Straits. Effort expended in this location in the future may be dependent upon price for brown king crab, other fishing opportunities, and other factors.



Table 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) king crab harvest by species, number of landings and number of vessels by year, 1960 to present.

| Year/<br>Season      | Red/Blue<br>King Crab | Number of<br>Landings | Number of<br>Vessels | Brown<br>King Crab | Number of<br>Landings | Number of<br>Vessels | Total<br>King Crab | Total<br>Landings | Total<br>Vessels |
|----------------------|-----------------------|-----------------------|----------------------|--------------------|-----------------------|----------------------|--------------------|-------------------|------------------|
| 1960                 |                       |                       |                      |                    |                       |                      | 3,424              |                   |                  |
| 1961                 |                       |                       |                      |                    |                       |                      | 429,600            |                   | 3                |
| 1962                 |                       |                       |                      |                    |                       |                      | 1,289,550          |                   | 8                |
| 1963                 |                       |                       |                      |                    |                       |                      | 1,112,200          |                   | 8                |
| 1964                 |                       |                       |                      |                    |                       |                      | 820,530            |                   | 9                |
| 1965                 |                       |                       |                      |                    |                       |                      | 579,300            |                   | 7                |
| 1966                 |                       |                       |                      |                    |                       |                      | 105,899            |                   | 8                |
| 1967                 |                       |                       |                      |                    |                       |                      | 599,078            |                   | 7                |
| 1968                 |                       |                       |                      |                    |                       |                      | 2,199,772          |                   | 19               |
| 1969                 |                       |                       |                      |                    |                       |                      | 1,899,930          |                   | 39               |
| 1969/70              | 1,438,226             |                       |                      | 359,567            |                       |                      | 1,797,793          | 460               | 33               |
| 1970/71              | 221,369               | 151                   | 20                   | 181,142            |                       |                      | 402,511            | 151               | 20               |
| 1971/72              | 391,623               | 213                   | 18                   | 372,933            |                       |                      | 764,556            | 213               | 18               |
| 1972/73              | 476,761               | 161                   | 17                   | 265,310            | 113                   | 10                   | 742,071            | 274               | 20               |
| 1973/74              | 640,369               | 207                   | 27                   | 179,520            | 92                    | 14                   | 819,889            | 299               | 31               |
| 1974/75              | 537,189               | 201                   | 28                   | 34,451             | 35                    | 7                    | 571,640            | 236               | 30               |
| 1975/76              | 346,341               | 170                   | 25                   | 68,429             | 31                    | 5                    | 414,770            | 201               | 25               |
| 1976/77              | 328,682               | 176                   | 90                   | 71,475             | 31                    | 6                    | 400,157            | 207               | 24               |
| 1977/78              | 241,984               | 152                   | 75                   | 81,746             | 47                    | 7                    | 323,730            | 199               | 24               |
| 1978/79              | 452,064               | 173                   | 87                   | 37,324             | 51                    | 11                   | 489,388            | 224               | 32               |
| 1979/80              | 670,859               | 246                   | 113                  | 46,551             | 74                    | 11                   | 717,410            | 320               | 38               |
| 1980/81              | 521,070               | 205                   | 106                  | 660,172            | 132                   | 20                   | 1,181,242          | 337               | 37               |
| 1981/82              | 537,501               | 189                   | 98                   | 622,666            | 240                   | 28                   | 1,160,167          | 429               | 42               |
| 1982/83              | 456,907               | 175                   | 69                   | 806,637            | 281                   | 27                   | 1,263,544          | 456               | 65               |
| 1983/84              | 319,642               | 164                   | 100                  | 996,887            | 314                   | 32                   | 1,316,529          | 478               | 90               |
| 1984/85              | 275,706               | 145                   | 96                   | 850,332            | 277                   | 64                   | 1,126,038          | 422               | 84               |
| 1985/86 <sup>1</sup> | 2,394                 | 19                    | 17                   | 696,211            | 212                   | 55                   | 698,605            | 231               | 55               |
| 1986/87 <sup>2</sup> | 1,179                 | 15                    | 13                   | 730,010            | 157                   | 82                   | 731,189            | 172               | 82               |
| 1987/88 <sup>3</sup> | 1,506                 | 36                    | 20                   | 648,600            | 164                   | 52                   | 650,106            | 200               | 52               |

<sup>1</sup> Red king crab season closed in Southeast Alaska, blue king crab open February 10-24, 1986.

<sup>2</sup> Red king crab season closed in Southeast Alaska, blue king crab open January 15-29, 1987.

<sup>3</sup> Red king crab season closed in Southeast Alaska, blue king crab open January 15-February 16, 1988. Brown king crab season still in progress; landings shown only through March 30, 1988.

Most recent year's data should be considered preliminary.

Table 2. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) red and blue king crab harvests in thousands of pounds by month and season, 1972/73 to present.

| Season               | Month  |        |        |        |        |        | Total Landings | Total Vessels |
|----------------------|--------|--------|--------|--------|--------|--------|----------------|---------------|
|                      | Sept   | Oct    | Nov    | Dec    | Jan    | Feb    |                |               |
| 1972/73              | 83.9   | 117.4  | 136.2  | 116.7  | 22.4   | Closed | 161            | 17            |
| 1973/74              | 171.8  | 228.1  | 184.0  | 50.1   | 6.2    | 0.1    | 207            | 27            |
| 1974/75              | 68.9   | 117.0  | 125.4  | 132.9  | 92.6   | 0.3    | 201            | 28            |
| 1975/76              | 45.4   | 111.7  | 68.6   | 57.0   | 59.5   | 4.1    | 170            | 25            |
| 1976/77              | 32.9   | 94.1   | 57.4   | 69.7   | 67.7   | 6.9    | 172            | 90            |
| 1977/78              | 38.9   | 43.9   | 45.3   | 50.9   | 57.2   | 5.7    | 152            | 75            |
| 1978/79              | 82.0   | 105.2  | 99.2   | 110.1  | 55.7   | Closed | 173            | 87            |
| 1979/80              | 209.4  | 182.5  | 174.3  | 104.7  | Closed | Closed | 246            | 113           |
| 1980/81              | 209.3  | 147.6  | 78.1   | 86.1   | Closed | Closed | 205            | 106           |
| 1981/82              | Closed | 327.8  | 176.3  | 33.4   | Closed | Closed | 189            | 98            |
| 1982/83              | Closed | 420.7  | 20.3   | 15.7   | 0.3    | Closed | 175            | 69            |
| 1983/84              | Closed | Closed | 292.9  | 18.8   | 7.9    | Closed | 164            | 100           |
| 1984/85              | Closed | 268.7  | 7.0    | Closed | Closed | Closed | 145            | 96            |
| 1985/86 <sup>1</sup> | Closed | Closed | Closed | Closed | 0.5    | 1.9    | 19             | 17            |
| 1986/87 <sup>2</sup> | Closed | Closed | Closed | Closed | 0.9    | 0.3    | 15             | 13            |

<sup>1</sup> Red king crab season closed; blue king crab open February 10-14, 1986.

<sup>2</sup> Red king crab season closed; blue king crab open January 15-29, 1987.

<sup>3</sup> Red king crab season closed; blue king crab open January 15-February 16, 1988.

Most recent year's data should be considered preliminary.

Table 3. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) red and blue king crab harvest in thousands of pounds by district and season, 1970/71 to present.

| Season               | District |        |        |        |        |        |        |        |        |       |       |        |        |       |      |        | Yakutat | Total |
|----------------------|----------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|--------|--------|-------|------|--------|---------|-------|
|                      | 1        | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10    | 11    | 12     | 13     | 14    | 15   | 16     |         |       |
| 1970/71              | 0.0      | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 3.2    | 45.2   | 118.3 | 130.8 | 48.6   | 1.1    | 0.8   | 53.8 | 0.0    | 0.0     | 401.8 |
| 1971/72              | 0.0      | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 7.0    | 21.7   | 231.4 | 164.4 | 57.8   | 95.4   | 46.2  | 17.5 | 0.0    | 0.0     | 641.4 |
| 1972/73              | 0.0      | 0.0    | 0.0    | 0.0    | 0.0    | 2.1    | 0.0    | 16.8   | 11.2   | 183.0 | 109.1 | 19.0   | 34.5   | 95.4  | 0.0  | 1.3    | 4.5     | 476.9 |
| 1973/74              | 0.0      | 0.0    | 0.0    | 0.0    | 0.1    | 0.8    | 0.3    | 4.3    | 21.2   | 273.4 | 114.3 | 25.1   | 78.4   | 87.9  | 34.6 | 0.0    | 0.0     | 640.4 |
| 1974/75              | 0.3      | 0.0    | 0.0    | 0.0    | 0.0    | 1.5    | 0.1    | 7.6    | 30.2   | 124.5 | 74.1  | 64.6   | 102.2  | 117.0 | 8.5  | 0.0    | 6.6     | 537.2 |
| 1975/76              | 0.0      | 0.0    | 0.0    | 0.0    | 0.5    | 0.1    | 0.0    | 15.8   | 3.2    | 30.4  | 35.1  | 53.4   | 97.5   | 103.7 | 6.7  | 0.0    | 0.0     | 346.4 |
| 1976/77              | 0.0      | 0.0    | 1.8    | 0.0    | 4.3    | 6.5    | 0.0    | 15.6   | 17.5   | 49.3  | 82.0  | 12.8   | 48.7   | 65.4  | 24.7 | 0.0    | 0.0     | 328.6 |
| 1977/78              | 1.1      | 0.0    | 0.0    | 0.0    | 4.6    | 3.7    | 0.0    | 5.3    | 0.0    | 43.0  | 64.4  | 8.3    | 68.8   | 22.2  | 16.7 | 0.0    | 3.9     | 242.0 |
| 1978/79              | 0.0      | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 6.6    | 0.0    | 118.5 | 122.6 | 14.1   | 112.5  | 43.1  | 29.7 | 0.0    | 5.1     | 452.2 |
| 1979/80              | 0.6      | 0.0    | 0.0    | 0.0    | 3.6    | 14.3   | 0.2    | 0.5    | 30.2   | 168.4 | 220.2 | 39.5   | 79.4   | 89.1  | 12.2 | 0.0    | 12.5    | 670.7 |
| 1980/81              | 1.1      | 0.0    | 0.0    | 0.0    | 0.0    | 2.8    | 4.3    | 27.6   | 11.8   | 163.7 | 172.3 | 7.9    | 73.1   | 5.2   | 41.4 | 0.0    | 9.8     | 521.0 |
| 1981/82              | 0.0      | 0.0    | 0.0    | 0.0    | 13.2   | 4.5    | 15.0   | 6.6    | 0.1    | 114.4 | 135.9 | 32.7   | 117.5  | 34.6  | 53.8 | 0.0    | 9.5     | 537.8 |
| 1982/83              | 0.0      | 0.0    | 0.0    | 0.0    | 7.3    | 0.0    | 1.4    | 1.5    | 2.5    | 77.5  | 63.7  | 98.0   | 70.8   | 99.4  | 30.6 | 0.0    | 4.1     | 456.8 |
| 1983/84              | 0.9      | 0.0    | 0.6    | 0.0    | 1.8    | 0.9    | 0.1    | 0.0    | 32.1   | 79.5  | 37.1  | 31.3   | 46.7   | 81.4  | 6.6  | 0.0    | 1.3     | 320.3 |
| 1984/85              | 0.8      | 0.0    | 0.2    | 0.0    | 0.0    | 0.0    | 0.0    | 1.0    | 0.6    | 58.7  | 89.9  | 14.0   | 51.9   | 49.7  | 9.9  | 0.0    | 0.0     | 276.7 |
| 1985/86 <sup>1</sup> | Closed   | Closed | Closed | Closed | Closed | Closed | Closed | Closed | Closed | 0.0   | 1.4   | Closed | Closed | 0.1   | 0.3  | Closed | 0.5     | 2.3   |
| 1986/87 <sup>2</sup> | Closed   | Closed | Closed | Closed | Closed | Closed | Closed | Closed | Closed | 0.0   | 0.4   | Closed | Closed | 0.5   | 0.3  | Closed | 0.0     | 1.2   |
| 1987/88 <sup>3</sup> | Closed   | Closed | Closed | Closed | Closed | Closed | Closed | Closed | Closed | 0.1   | 0.6   | Closed | Closed | 0.7   | 0.0  | Closed | 0.0     | 1.4   |

<sup>1</sup> The 1985/86 red king crab season was closed; blue king crab open February 10-24, 1986.

<sup>2</sup> The 1986/87 red king crab season was closed; blue king crab open January 15-February 29, 1987.

<sup>3</sup> The 1987/88 red king crab season was closed; blue king crab open January 15-February 16, 1988.

Most recent year's data should be considered preliminary.



Table 5. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) brown king crab harvests in thousands of pounds by month and season, 1972/73 to present.

| Season               | Oct   | Nov   | Dec  | Jan   | Feb   | Mar   | Apr                          | May  | Jun  | Jul  | Aug  | Sep  | Total   | Landings | Fished |
|----------------------|-------|-------|------|-------|-------|-------|------------------------------|------|------|------|------|------|---------|----------|--------|
| 1972/73              | 18.1  | 43.7  | 18.6 | 22.0  | 26.3  | 19.5  | 35.6                         | 11.0 | 6.0  | 11.1 | 9.6  | 43.8 | 265.3   | 113      | 10     |
| 1973/74              | 25.6  | 21.4  | 15.6 | 16.5  | 12.2  | 24.6  | 30.9                         | 15.5 | 0.0  | 0.0  | 3.2  | 13.9 | 179.4   | 92       | 14     |
| 1974/75              | 8.9   | 4.9   | 3.2  | 4.5   | 1.4   | 2.8   | 3.8                          | 0.0  | 0.0  | 0.0  | 0.0  | 5.0  | 34.5    | 35       | 7      |
| 1975/76              | 16.1  | 4.8   | 7.9  | 13.2  | 1.4   | 13.2  | 1.7                          | 0.3  | 0.0  | 0.0  | 2.6  | 7.0  | 68.2    | 21       | 5      |
| 1976/77              | 12.0  | 9.1   | 8.5  | 10.3  | 11.5  | 9.1   | 7.5                          | 0.0  | 0.0  | 0.0  | 0.0  | 7.0  | 75.0    | 30       | 6      |
| 1977/78              | 9.6   | 7.2   | 15.1 | 13.5  | 10.0  | 11.7  | 14.3                         | 0.0  | 0.0  | 0.0  | 0.0  | 1.3  | 82.7    | 53       | 14     |
| 1978/79              | 5.9   | 4.4   | 8.7  | 9.7   | 5.9   | 5.9   | 3.7                          | 0.1  | 0.0  | 0.0  | 2.2  | 3.3  | 49.8    | 65       | 10     |
| 1979/80              | 4.7   | 8.9   | 5.6  | 9.0   | 16.5  | 34.8  | 44.9                         | 10.4 | 6.8  | 8.8  | 0.0  | 13.9 | 164.3   | 80       | 20     |
| 1980/81              | 30.2  | 43.2  | 18.2 | 79.3  | 168.7 | 167.7 | 85.3                         | 19.1 | 32.1 | 15.2 | 10.4 | 14.0 | 683.4   | 147      | 30     |
| 1981/82              | 43.0  | 41.7  | 44.0 | 17.9  | 65.8  | 80.9  | 70.7                         | 20.9 | 82.0 | 70.0 | 55.8 | 60.2 | 652.9   | 255      | 54     |
| 1982/83              | 173.5 | 77.3  | 65.3 | 0.0   | 115.8 | 159.3 | 15.0                         | 46.8 | 27.5 | 35.2 | 59.8 | 24.0 | 799.5   | 273      | 69     |
| 1983/84              | 23.7  | 52.8  | 11.0 | 33.7  | 152.7 | 303.5 | 287.7                        | 53.4 | 32.2 | 11.0 | 6.9  | 6.3  | 974.9   | 307      | 90     |
| 1984/85              | 166.9 | 250.8 | 19.9 | 14.9  | 117.8 | 172.5 | 22.3                         | 19.6 | 24.9 | 8.1  | 19.1 | 11.9 | 848.7   | 277      | 124    |
| 1985/86              | 39.8  | 53.8  | 41.1 | 32.1  | 240.4 | 249.5 | 8.6                          | 4.5  | 14.7 | 1.4  | 3.4  | 9.0  | 698.3   | 211      | 61     |
| 1986/87              | 147.5 | 80.0  | 46.3 | 326.2 | 136.4 | 70.5  | 67.9                         | 39.3 | 38.9 | 17.6 | 27.8 | 18.0 | 1,016.4 | 221      | 51     |
| 1987/88 <sup>1</sup> | 13.0  | 15.2  | 8.0  | 275.1 | 288.9 | 48.4  | -----Season in Progress----- |      |      |      |      |      | 648.6   | 164      | 52     |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 6. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) brown king crab harvests in thousands of pounds by district and season, 1972/73 to present.

| Season               | District |     |     |     |     |      |      |     |       |       |      |       |      |       |      |     |     | Total   |
|----------------------|----------|-----|-----|-----|-----|------|------|-----|-------|-------|------|-------|------|-------|------|-----|-----|---------|
|                      | 1        | 2   | 3   | 4   | 5   | 6    | 7    | 8   | 9     | 10    | 11   | 12    | 13   | 14    | 15   | 16  | 183 |         |
| 1972/73              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.4 | 10.5  | 186.5 | 36.2 | 5.8   | 0.0  | 2.6   | 23.4 | 0.0 | 0.0 | 265.4   |
| 1973/74              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.1 | 0.5   | 149.2 | 24.6 | 0.0   | 0.6  | 4.1   | 0.4  | 0.0 | 0.0 | 179.5   |
| 1974/75              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.1 | 14.9  | 12.3  | 0.7  | 5.2   | 0.0  | 1.4   | 0.1  | 0.0 | 0.0 | 34.7    |
| 1975/76              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.6 | 0.0   | 58.8  | 0.0  | 1.3   | 3.5  | 0.8   | 3.5  | 0.0 | 0.0 | 68.5    |
| 1976/77              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.0 | 8.6   | 65.8  | 1.1  | 0.1   | 0.0  | 0.0   | 0.2  | 0.0 | 0.0 | 75.8    |
| 1977/78              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.1 | 0.0   | 73.7  | 7.3  | 0.6   | 0.3  | 0.0   | 0.7  | 0.0 | 0.0 | 82.7    |
| 1978/79              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 0.0 | 0.0   | 36.7  | 6.7  | 1.3   | 0.0  | 0.5   | 4.6  | 0.0 | 0.0 | 49.8    |
| 1979/80              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 1.1 | 0.0   | 61.3  | 21.8 | 61.8  | 0.0  | 0.3   | 16.7 | 0.0 | 1.4 | 164.4   |
| 1980/81              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 1.2 | 6.4   | 204.6 | 25.9 | 169.7 | 0.1  | 221.7 | 53.6 | 0.0 | 0.0 | 683.2   |
| 1981/82              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 0.0  | 0.0  | 6.1 | 48.8  | 248.0 | 48.8 | 92.9  | 6.2  | 152.6 | 49.4 | 0.0 | 0.0 | 652.8   |
| 1982/83              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 13.9 | 10.2 | 7.3 | 109.2 | 185.7 | 52.6 | 225.8 | 12.9 | 144.0 | 37.9 | 0.0 | 0.0 | 799.5   |
| 1983/84              | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 3.2  | 5.4  | 5.4 | 135.0 | 222.7 | 24.6 | 438.2 | 0.1  | 46.5  | 93.9 | 0.0 | 0.0 | 975.0   |
| 1984/85              | 0.0      | 5.1 | 0.0 | 0.0 | 0.0 | 4.5  | 14.1 | 0.1 | 192.3 | 375.9 | 34.5 | 153.3 | 2.5  | 52.8  | 13.1 | 0.6 | 0.0 | 848.8   |
| 1985/86              | 0.0      | 4.0 | 0.6 | 0.0 | 0.0 | 17.6 | 3.7  | 4.6 | 234.0 | 324.4 | 35.6 | 23.3  | 0.1  | 24.8  | 25.3 | 0.0 | 0.0 | 698.0   |
| 1986/87              | 1.6      | 0.0 | 0.0 | 0.0 | 0.0 | 10.9 | 12.4 | 0.0 | 609.0 | 298.8 | 43.8 | 22.4  | 0.0  | 1.5   | 16.2 | 0.0 | 0.0 | 1,016.6 |
| 1987/88 <sup>1</sup> | 0.0      | 0.0 | 0.0 | 0.0 | 0.0 | 1.4  | 4.6  | 0.8 | 150.2 | 316.9 | 36.9 | 84.1  | 0.0  | 27.7  | 26.0 | 0.0 | 0.0 | 648.6   |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 7. Statistical Area A (Southeast) summary of brown king crab dockside samples from 1970/71 to present.

| Season               | Number of Landings Sampled | Number of Crab Sampled | Average Carapace Length (mm) |
|----------------------|----------------------------|------------------------|------------------------------|
| 1970/71              | 16                         | 1,132                  | 174.5                        |
| 1971/72              | 9                          | 906                    | 175.4                        |
| 1972/73              | 12                         | 1,153                  | 174.4                        |
| 1973/74              | 8                          | 605                    | 173.6                        |
| 1974/75              | 1                          | 104                    | 170.4                        |
| 1975/76              | 10                         | 940                    | 171.8                        |
| 1976/77              | 2                          | 150                    | 168.5                        |
| 1977/78              | 8                          | 727                    | 170.0                        |
| 1978/79              | 6                          | 498                    | 171.0                        |
| 1979/80              | 2                          | 478                    | 169.8                        |
| 1980/81              | 20                         | 1,354                  | 171.6                        |
| 1981/82              | 8                          | 712                    | 175.4                        |
| 1982/83              | 17                         | 1,489                  | 169.5                        |
| 1983/84              | 10                         | 703                    | 169.6                        |
| 1984/85              | 11                         | 1,368                  | 165.3                        |
| 1985/86              | 17                         | 1,765                  | 166.6                        |
| 1986/87              | 39                         | 4,488                  | 167.9                        |
| 1987/88 <sup>1</sup> | 49                         | 4,605                  | 173.5                        |
| Average              | 14                         | 1,288                  | 171.0                        |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 8. Statistical Area A (Southeast Alaska) comparison of historic red king crab indexing data, 1979 to present.

|                               | 1979  | 1980  | 1981  | 1982  | 1983  | 1984  | 1985  | 1986  | 1987 <sup>5</sup><br>Summer | 1987 <sup>5</sup><br>Autumn |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------------------|-----------------------------|
| Number of Pot Lifts           | 320   | 295   | 371   | 414   | 390   | 378   | 385   | 469   | 197                         | 157                         |
| Red King Crab                 |       |       |       |       |       |       |       |       |                             |                             |
| No. females captured          | 5,140 | 2,611 | 5,009 | 4,079 | 2,933 | 2,325 | 2,079 | 2,396 | 1,647                       | 740                         |
| No. males captured            | 4,288 | 3,217 | 4,475 | 2,386 | 2,439 | 2,090 | 1,490 | 2,345 | 1,110                       | 847                         |
| No. legals captured           | 1,134 | 829   | 998   | 951   | 828   | 917   | 528   | 689   | 264                         | 161                         |
| No. sublegals captured        | 3,154 | 2,388 | 3,477 | 1,435 | 1,611 | 1,174 | 963   | 1,655 | 846                         | 686                         |
| Tanner Crab                   |       |       |       |       |       |       |       |       |                             |                             |
| No. females captured          | 902   | 732   | 977   | 2,026 | 1,322 | 683   | 1,278 | 1,967 | 992                         | 468                         |
| No. males captured            | 1,628 | 3,309 | 5,771 | 4,819 | 3,695 | 2,464 | 4,834 | 5,128 | 2,862                       | 1,330                       |
| No. legals captured           | 803   | 1,766 | 3,573 | 2,435 | 1,897 | 995   | 1,992 | 2,000 | 1,365                       | 531                         |
| No. sublegals captured        | 825   | 1,543 | 2,198 | 2,384 | 1,798 | 1,468 | 2,842 | 3,128 | 1,497                       | 799                         |
| Halibut <sup>4</sup>          |       |       |       |       |       |       |       |       |                             |                             |
| No. captured                  | 204   | 369   | 574   | 848   | 623   | 779   | 802   | 785   | 307                         | 158                         |
| No. legals captured           | 86    | 163   | 248   | 320   | 203   | 316   | 285   | 323   | 101                         | 44                          |
| Avg. length (cm)              | 78.2  | 79.1  | 79.1  | 77.4  | 75.7  | 77.8  | 78.3  | 82.6  | 78.4                        | 75.6                        |
| Avg. weight (kg) <sup>2</sup> | 5.8   | 5.8   | 5.8   | 5.2   | 5.2   | 5.2   | 5.8   | 6.8   | 5.5                         | 5.1                         |
| Pacific Cod <sup>4</sup>      |       |       |       |       |       |       |       |       |                             |                             |
| No. captured                  | 79    | 166   | 246   | 537   | 287   | 449   | 390   | 390   | 225                         | 326                         |
| Avg. length (cm) <sup>3</sup> | 71.8  | 67.8  | 64.9  | 65.0  | 62.4  | 64.7  | 64.2  | 62.7  | 62.1                        | 58.4                        |
| Avg. weight (kg) <sup>3</sup> | 4.5   | 3.7   | 3.3   | 3.3   | 2.9   | 3.2   | 3.2   | 2.9   | 2.9                         | 2.4                         |

<sup>1</sup> Crab data is standardized to 24 hour soak.

<sup>2</sup> Utilized IPHC table to convert length in cm to round weight in kg.

<sup>3</sup> Utilized  $\log_{10} W = 3.1 \log_{10} L - 2.103462$  from Ketchen, 1967 FRBC Tech. Report No. 23.

<sup>4</sup> Halibut and pacific Cod catches are unstandardized.

<sup>5</sup> Partial surveys were conducted in July and October of 1987.



Table 9. Statistical Area A (Southeast Alaska) summary of standardized red king crab index data in percent by size/age class, 1979 to present.

| Year              | Sample Size | Prerecruits |        |       |       | Recruits | Post-Recruits |
|-------------------|-------------|-------------|--------|-------|-------|----------|---------------|
|                   |             | Fours       | Threes | Twos  | Ones  |          |               |
| 1979              | 4,288       | 7.42        | 19.23  | 27.40 | 23.27 | 16.01    | 6.7           |
| 1980              | 3,217       | 7.19        | 12.19  | 20.40 | 30.46 | 19.66    | 10.1          |
| 1981              | 4,475       | 6.31        | 17.14  | 24.71 | 27.93 | 16.14    | 7.8           |
| 1982              | 2,386       | 3.41        | 10.53  | 19.63 | 27.60 | 19.49    | 19.4          |
| 1983              | 2,439       | 6.08        | 12.64  | 29.23 | 26.22 | 17.14    | 8.7           |
| 1984              | 2,090       | 3.46        | 9.93   | 16.58 | 32.98 | 22.16    | 14.9          |
| 1985              | 1,490       | 7.86        | 16.19  | 19.76 | 28.57 | 15.24    | 12.4          |
| 1986 <sup>1</sup> | 2,345       | 24.50       | 23.07  | 18.62 | 15.18 | 8.98     | 9.7           |
| 1987 <sup>2</sup> |             |             |        |       |       |          |               |
| Summer            | 1,110       | 8.19        | 20.97  | 24.74 | 20.76 | 15.87    | 9.5           |
| Autumn            | 847         | 26.17       | 22.00  | 20.05 | 15.48 | 9.24     | 7.1           |

<sup>1</sup> The survey design was changed in 1986 and new areas added.

<sup>2</sup> These statistics are not directly comparable to 1979-86 data because only partial surveys were conducted. Four bays were surveyed in the summer and two in the autumn.

Table 10. Statistical Area A (Southeast Alaska) comparison of standardized index data and commercial sampling data of red king crab, 1979 to present.

| Year              | Sample Size | Number of Pot Lifts | Number of Sublegals | Standardized Index Data |                    |                        | Proportion of Recruits in Legal Pop. | Proportion of Postrecruits In Legal Pop. |
|-------------------|-------------|---------------------|---------------------|-------------------------|--------------------|------------------------|--------------------------------------|--|
|                   |             |                     |                     | Number of Legals        | Number of Recruits | Number of Postrecruits |                                      |  |
| 1979              | 4,288       | 320                 | 3,154               | 1,134                   | 707                | 426                    | 0.6235                               | 0.3765                                   |
| 1980              | 3,217       | 295                 | 2,388               | 829                     | 519                | 311                    | 0.6261                               | 0.3739                                   |
| 1981              | 4,475       | 371                 | 3,477               | 998                     | 670                | 328                    | 0.6713                               | 0.3287                                   |
| 1982              | 2,386       | 414                 | 1,435               | 951                     | 576                | 374                    | 0.6057                               | 0.3943                                   |
| 1983              | 2,439       | 389                 | 1,611               | 828                     | 474                | 354                    | 0.5725                               | 0.4275                                   |
| 1984              | 2,090       | 378                 | 1,174               | 917                     | 490                | 427                    | 0.5344                               | 0.4656                                   |
| 1985              | 1,490       | 385                 | 963                 | 528                     | 267                | 261                    | 0.5057                               | 0.4943                                   |
| 1986 <sup>1</sup> | 2,345       | 469                 | 1,655               | 689                     | 322                | 367                    | 0.4673                               | 0.5327                                   |
| 1987 <sup>1</sup> |             |                     |                     |                         |                    |                        |                                      |  |
| Summer            | 1,110       | 197                 | 846                 | 264                     | 171                | 93                     | 0.6477                               | 0.3523                                   |
| Autumn            | 847         | 157                 | 686                 | 161                     | 83                 | 78                     | 0.5155                               | 0.4845                                   |
| Average           |             |                     |                     |                         |                    |                        | 0.5862                               | 0.4138                                   |

| Season  | Sample Size                 | Commercial Dockside Sampling Data |                            | Number of Recruits | Number of Postrecruits | Proportion of Recruits in Legal Pop. | Proportion of Postrecruits In Legal Pop. |
|---------|-----------------------------|-----------------------------------|----------------------------|--------------------|------------------------|--------------------------------------|--|
|         |                             | Number Less than 145 mm           | Number Greater than 145 mm |                    |                        |                                      |  |
| 1979/80 | 3,495                       | 170                               | 3,325                      | 2,032              | 1,282                  | 0.6111                               | 0.3889                                   |
| 1980/81 | 4,235                       | 254                               | 3,981                      | 2,368              | 1,613                  | 0.5948                               | 0.4052                                   |
| 1981/82 | 3,413                       | 117                               | 3,296                      | 1,670              | 1,626                  | 0.5067                               | 0.4933                                   |
| 1982/83 | 2,808                       | 104                               | 2,704                      | 1,358              | 1,346                  | 0.5022                               | 0.4978                                   |
| 1983/84 | 3,566                       | 154                               | 3,412                      | 1,956              | 1,456                  | 0.5733                               | 0.4267                                   |
| 1984/85 | 2,238                       | 67                                | 2,171                      | 980                | 1,191                  | 0.4514                               | 0.5486                                   |
| 1985/86 | Red King Crab Season Closed |                                   |                            |                    |                        |                                      |  |
| 1986/87 | Red King Crab Season Closed |                                   |                            |                    |                        |                                      |  |
| 1987/88 | Red King Crab Season Closed |                                   |                            |                    |                        |                                      |  |
| Average |                             |                                   |                            |                    |                        | 0.5487                               | 0.4513                                   |

<sup>1</sup> In 1987 partial surveys were conducted during summer in four bays and during autumn in two bays. These statistics cannot be directly compared to the full summer surveys of 1979-1986. NOTE: Legal population is all males greater than or equal to 145 mm in carapace length.

REPORT TO THE BOARD OF FISHERIES  
SOUTHEAST ALASKA (STATISTICAL AREA A)  
AND  
YAKUTAT (STATISITCAL AREA D)  
DUNGENESS CRAB  
1987 / 1988

By  
Ken Imamura

Southeast Region  
Alaska Department of Fish and Game  
Division of Commercial Fisheries

April 1988

## TABLE OF CONTENTS

|  | <u>Page</u> |
|--|-------------|
| BACKGROUND .....                           | 3.3         |
| SEASON SUMMARY .....                       | 3.7         |
| Yakutat Tanner Crab Fishery .....          | 3.7         |
| Southeast Alaska Tanner Crab Fishery ..... | 3.7         |
| ISSUES .....                               | 3.10        |

## LIST OF TABLES

| <u>Table</u>   | <u>Page</u> |
|--|-------------|
| 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) Tanner crab commercial catches, 1961 to present .....  | 3.12        |
| 2. Statistical Area D (Yakutat) Tanner crab, harvest in thousands of pounds by district and season, 1968 to present .....  | 3.13        |
| 3. Statistical Area D (Yakutat) Tanner crab, harvest in thousands of pounds by district and season, 1968/69 to present .....   | 3.14        |
| 4. Statistical Area A (Southeast Alaska) Tanner crab, harvest in thousands of pounds by district and season, 1968/69 to present .....  | 3.15        |
| 5. Statistical Area A (Southeast Alaska) Tanner crab, harvest in thousands of pounds by month and season, 1968/69 to present .....   | 3.16        |
| 6. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) Tanner crab, commercial dockside size frequency sampling summary by size class in percent of sample, 1968/69 season to present ..... | 3.17        |

## BACKGROUND

Two commercially significant species of Tanner crab (*Chionoecetes bairdi* and *C. opilio*) are harvested from Alaskan waters. Only *C. bairdi* is known to be present in Statistical Area A or D. Statistical Area A comprises the waters of Southeastern Alaska's Alexander Archipelago. Statistical Area D covers the marine waters between Cape Fairweather and Cape Suckling. Both areas are managed by Region 1 Commercial Fisheries staff. Separate fishing seasons and guideline harvest levels have been established for each area.

The Yakutat fishing area is characterized by exposed waters of the eastern Gulf of Alaska. Historically, this fishery attracted larger, long-range vessels with large live tanks in which tons of crabs could be kept for extended periods of time. Many were also engaged in fisheries for other species of shellfish in other areas of the state. These vessels generally used side-loading king crab pots wrapped with smaller mesh for the Tanner fishery. With the advent of the regulation prohibiting the use of side-loading pots in the Yakutat Tanner fishery in 1983, some of these vessels may have decided that investment in top-loading gear was not economically justifiable for entry into this relatively low volume fishery. For the previous four seasons, only small, local vessels operating out of Yakutat opted to enter the fishery. During the early spring opening in 1987, about five larger vessels based in Kodiak, Valdez and Pelican also registered for this fishery. In 1988, only one larger open ocean boat and several smaller vessels fishing around Yakutat Bay entered the fishery.

The Southeastern Alaska fishing area consists of the relatively protected inshore waters south and east of Cape Fairweather and north of Dixon Entrance. This fishery supports a fleet of about 90 vessels. Most are small, generally ranging in size between 35 to 50 feet keel length. There are a few vessels with keel lengths up to about 70 feet also in the fishery. Most of these vessels are designed and used primarily for other fisheries such as those in the summer for salmon and halibut.

Winter crabbing is generally a secondary source of income during the off season. Most of these vessels are at least temporarily equipped with rudimentary live-tanking capabilities for the crabbing season. Much of the gear used is stacking or nesting gear which takes up less deck space than the traditional, non-nesting, seven-foot square king crab pots that are also used by some operators. The effectiveness of the conical or pyramid gear is probably comparable to that of the heavier square pots for Tanner crab and the nesting gear is lighter and easier to handle and stow on smaller vessels. There is probably a tendency for the larger vessels to use square, side-loading pots because the larger vessels have the deck space to accommodate this type of non-nesting gear. Some crabbers also have the perception that the heavier square pots fish more effectively, at least for king crab. Choice of gear type may then be dictated to some extent by whether only Tanner crab or a combination of Tanner crab and king crab will be targeted during a combined opening for these species.

Historical Region 1 Tanner crab landings are shown in Table 1. Although Tanner crab landings were reported in the Southeastern area in the early 1960's, it was not until the early 1970's that intensive fisheries were conducted in either the Southeastern or Yakutat areas. Tanner crab were commonly discarded by crabbers fishing for other species because they brought low prices well into the mid-1970's.

Tanner crab landings averaged approximately 1.5 million pounds in the Yakutat fishery between the 1972/73 and 1979/80 seasons. Following a record catch of approximately 2.4 million pounds during the 1979/80 season the harvest of Tanner crab there has declined. Although most of the harvest has historically occurred between the months of February and April (Table 2), the season was longer during the earlier years of the fishery. The season currently extends between January 15 and May 1, reflecting the trends of harvest set during the earlier years of the fishery.

The Southeastern Alaska Tanner crab fishery has produced an average annual harvest of approximately 1.7 million pounds since the 1972/73 season. During

this period seasonal landings ranged from 0.8 to 2.5 million pounds. Most of the harvest has historically been taken during the January through April period in Districts 10, 11, and 14. These districts correspond approximately to Frederick Sound, Stephens Passage, and Icy Straits. In each of the last five seasons, the fishery has lasted no longer than two months and is becoming progressively shorter.

In the 1981/82 season that extended from December of 1981 to mid-April of 1982, 2.8 million pounds of Tanner crab, a record, were harvested by 46 vessels. More than half of this total was landed from the Icy Straits area in District 14. Climbing demand for Tanner crab, an earlier season opening in Southeast Alaska than in fishing areas further northward and westward, an open registration status, and the record landing led to a doubling of the number of vessels fishing the 1982/83 season. The effort expended in Icy Straits was unprecedented (Tables 1 and 4). The season, which closed in two weeks, was the shortest on record. As a result of this, several measures to prevent a recurrence were pursued by both the Department and the industry. The season was changed by the Board of Fisheries early in 1983 so its opening date coincided with those elsewhere in the state.

Superexclusive registration status for the Southeast Alaska portion of Statistical Area A was implemented prior to the 1985/86 season. This change effectively limited vessel participation by precluding entry of vessels registered for Southeast Alaska into any other Tanner fishery in the State. Further restrictions to participation occurred prior to the 1985/86 season when a moratorium on issuance of new Tanner and king crab permits for Southeast Alaska was initiated. The interim permits issued under the moratorium are to be superceded by limited entry permits. A maximum transferable effort level of 83 Tanner vessels will be permitted. These measures have succeeded in stabilizing the effort in these fisheries but at levels about sixty percent higher than that prior to the 1981/82 season (Table 1).

In 1986, the Board of Fisheries adopted a regulation to restrict the boundaries of Statistical Area A to those waters of the state between Dixon



Entrance and Cape Fairweather and to establish a new designation of Statistical Area D for those waters of the state between Cape Fairweather and Cape Suckling. Major restructuring of the administrative code delayed implementation of this Board action until early in 1987.

A significant processing problem first identified during the 1984/85 season, the bitter crab syndrome caused by the dinoflagellate *Hematodinium* sp. persisted in crab from upper Lynn Canal. A special survey was conducted by the Department on some of the fishing grounds in the Sullivan Island area of Lynn Canal in the summer of 1986. It detected infection rates in excess of 95 percent of all segments of the Tanner crab population in this area. Based on this survey and the high percentage of infected crab in the commercial harvest from this area during the previous season, a segment of Lynn Canal was closed to commercial Tanner crab fishing during the 1986/87 season. Subsequent Department sponsored surveys of the area in March 1987, confirmed a continuing high incidence of infected Tanner crab. Another survey in the fall suggested that the infection rate had abated somewhat so the area was reopened for the 1987/88 season.

Preliminary laboratory research indicates that the disease is fatal to the crab.

Both Yakutat and Southeastern fisheries have shown a greater dependency on recruit crab in recent years. This is evident in the small average sizes of crab sampled in the most recent years. Greater variations in annual harvest levels can be expected to occur in a recruit fishery than in a mixed age class fishery. In a recruit fishery, survival of a single year class determines whether a commercially harvestable surplus is available to the fishery each season. There is essentially no carry over of a portion of the recruitment into following seasons (Table 6).

## SEASON SUMMARY

The 1987/88 season in Southeast Alaska lasted from January 15, 1988 to February 16, 1988. Other than the very atypical 1982/83 season that lasted two weeks, this was the shortest season on record. The short opening reflects a trend toward shorter fishing periods in recent seasons and is an indication of the increasing effectiveness of both the participants and their gear. The Yakutat fishing area opened on January 15 and will close on May 1, 1988 unless unforeseen circumstances necessitate an earlier closure by emergency order. Ex-vessel prices for both fishing areas opened at \$2.20 per pound and rose to \$2.45 by the closure. At an average \$2.33 per pound the Southeast Alaska fishery was worth slightly more than \$3.0 million to the fishermen.

### Yakutat Tanner Crab Fishery

Three or fewer vessels have reported landings of Tanner crab from Statistical Area D. It is unlikely that the preseason harvest ceiling of 100,000 pounds will be exceeded this season.

### Southeast Alaska Tanner Crab Fishery

One hundred thirteen vessels registered for the 1987/88 Statistical Area A Tanner crab fishery. Of these, eight were registered as tenders and fifteen for use of ring nets only.

The remainder registered for some combination of Tanner and the two species of king crab for which there was a fishery. Eighty-four permit holders reported landing at least some Tanner crab. As in the past several seasons,

some vessels registered for combinations of king and Tanner crab but fished for only one species or predominantly one species.

The number of vessels registered as tenders has increased with each of the past three seasons. This indicates intensified fishing effort by pot fishermen and increasing competition for the available crab by processors.

The number of vessels registered for ring net fishing has also increased. This probably reflects a desire by new fishermen to enter a fishery otherwise closed to them by the moratorium on issuance of new permits for pot gear. Combinations of various permits for ring and pot gear are currently allowed and some imaginative arrangements for deployment of both types of gear have evolved. As long as ring net fishing remains economically viable and open to entry, the number of ring net fishermen will probably increase.

The harvest for Southeast Alaska was managed for a total catch between 1.0 and 1.5 million pounds. The midpoint of the range (1.25 million pounds) was projected as the target tonnage based on available survey information, historical catch figures, and recent fleet performance indicators. A total of 1,290,250 pounds of live crab were landed and processed. Of this, 12,450 pounds were landed by vessels registered to fish only ring nets. As in the past several seasons, landings from Districts 14, 10, and 11 comprised the major part of the total landings. While District 11 retained its relative importance, District 10 contributions to the total catch rose during the 1987/88 season to closely approximate that of District 14 (Table 4). It is possible that the intensive brown king crab fishery in Frederick Sound created conditions conducive to increased Tanner crab landings from District 10.

The fishery was notable for the bad weather that accompanied the opening. Although fully half the opening was hampered by at least localized drainage winds and freezing spray, the newly molted and old shell condition of many of the crabs sampled at the close of the fishery indicated that the upper District 11 stocks had probably been quite heavily exploited regardless of

the weather. The relatively high landings from District 10 were also an indirect indication that the fishery was not overly restricted by inclement weather.

Reported deadloss from a variety of causes totalled about 16,000 pounds. As in the past two seasons, a high, though unquantified portion of the deadloss, was attributable to sorting and discarding of crab infected by the dinoflagellate (*Hematodinium sp.*). The reported deadloss was probably a very conservative estimate. Although a few processors and tenders were very conscientious about weighing and reporting deadloss, no one profits from unmarketable or dead crab so some processors simply discarded deadloss without reporting it.

*Hematodinium sp.* is the causative agent of the bitter crab syndrome. Fortunately, the parasite is only known to occur in significant numbers in upper Lynn Canal and in lesser numbers in a few other areas. An elevated incidence of this infection has persisted for the past three seasons in the upper Lynn Canal fishing grounds. These grounds, which were closed last year, were reopened this season when a Department survey conducted in October suggested that the percentage of crab with clinical signs of the infection was declining. The actual catch from this area during the late winter season appeared to belie this conclusion. There will probably continue to be some concern about fishing this area during the next season. Serological samples were collected from Pybus Bay, Deadmans Reach, Excursion Inlet, Barlow Cove and Eagle River during the summer king crab survey but have not been examined yet.

There continue to be both confirmed and unconfirmed reports of low levels of the infection in other segments of the District 11 stock. Most notably, crab harvested from the Youngs Bay and Taku Harbor areas, as well as isolated bays in lower Stephens Passage, in District 10, seem to exhibit low infection rates. The level of infection in crab harvested from these areas has remained fairly constant over the past few seasons.

The 1987/88 season was notable because more new processors entered the field and competed for the available harvest. The increase in numbers and activity of tenders was most evident in the northern districts. Field sampling was deterred by the mobility and remoteness of some new processors and tenders more this season than in the past several. Some new processors had no experience with sorting infected crab and there was some concern early in the season that some bitter crab was being inadvertently processed.

The only new regulation specified placement of escape rings, in their entirety, within eight inches from the bottom of the pot.

## ISSUES

The bitter taste syndrome, caused by infection with the dinoflagellate *Hematodinium sp.*, will demand more study. The possible consequences of its spreading to uninfected stocks and its interactions with commercial harvest will need to be considered in Tanner crab management. The potential for spreading this disease by transport, handling, and possible discarding of diseased crab is unknown. Spread of the disease could affect the continued viability of a commercial fishery.

This occurrence of *Hematodinium sp.* is an opportunity to formulate a policy to deal with future outbreaks of infection in commercial shellfish. Such a policy should outline the procedures and practices that will be considered when such infections are identified. These could include sampling procedures, area closures, transport and processing restrictions, and differential harvest practices.

Vessel operators were allowed to store their gear in the water this season prior to the fishery in areas designated by the Fish and Wildlife Protection Division of the Department of Public Safety. The somewhat controversial program apparently operated without serious problems in its second year.

Barring exceptionally good or poor recruitment, the Southeast Alaska seasonal harvest should fluctuate between about 750,000 and one million pounds in the near future. It will continue to depend heavily on recruit-sized crab. The seasonal harvest for Yakutat shows very little hope for improvement and will probably remain at very low levels, capable of supporting only a very small local fishery until a year class experiences exceptional early survival and recruits strongly into the fishery.

Table 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) Tanner crab commercial catches, 1961 to present.

| Year/<br>Season      | Southeast          |                         |                         |                          |                          | Yakutat            |                         |                         |                          |                          | Total<br>Statistical Area A + D |                   |
|----------------------|--------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------|-------------------------|-------------------------|--------------------------|--------------------------|---------------------------------|-------------------|
|                      | Catch<br>in Pounds | Number<br>of<br>Vessels | Pounds<br>per<br>Vessel | Number<br>of<br>Landings | Pounds<br>per<br>Landing | Catch<br>in Pounds | Number<br>of<br>Vessels | Pounds<br>per<br>Vessel | Number<br>of<br>Landings | Pounds<br>per<br>Landing | Catch<br>in Pounds              | Number<br>Vessels |
| 1961                 | 6,800              | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 6,800                           | -                 |
| 1962                 | 7,820              | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 7,820                           | -                 |
| 1963                 |                    | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 0                               | 0                 |
| 1964                 | 13,940             | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 13,940                          | -                 |
| 1965                 |                    | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 0                               | 0                 |
| 1966                 |                    | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 0                               | 0                 |
| 1967                 | 2,733              | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 2,733                           | -                 |
| 1968                 | 109,220            | -                       |                         |                          |                          | -                  | -                       |                         |                          |                          | 109,220                         | -                 |
| 1968/69              | 176,277            | -                       |                         | 76                       | 2,319                    | -                  | -                       |                         |                          |                          | 176,277                         | -                 |
| 1969/70              | 660,337            | -                       |                         | 347                      | 1,903                    | -                  | -                       |                         |                          |                          | 660,337                         | -                 |
| 1970/71              | 167,378            | -                       |                         | 72                       | 2,325                    | -                  | -                       |                         |                          |                          | 167,378                         | -                 |
| 1971/72              | 656,661            | -                       |                         | 274                      | 2,397                    | -                  | -                       |                         |                          |                          | 656,661                         | -                 |
| 1972/73              | 1,600,748          | -                       |                         | 354                      | 4,522                    | 222,441            | *                       |                         | *                        |                          | 1,823,189                       | -                 |
| 1973/74              | 1,309,673          | -                       |                         | 419                      | 3,126                    | 1,872,357          | -                       |                         | 110                      | 17,021                   | 3,182,030                       | -                 |
| 1974/75              | 863,751            | 29                      | 29,785                  | 244                      | 3,540                    | 1,972,752          | 13                      | 151,750                 | 60                       | 32,879                   | 2,836,503                       | 42                |
| 1975/76              | 2,149,397          | 31                      | 69,335                  | 369                      | 5,825                    | 1,762,589          | 5                       | 352,518                 | 35                       | 50,360                   | 3,911,986                       | 36                |
| 1976/77              | 2,538,950          | 57                      | 44,543                  | 379                      | 6,699                    | 966,650            | 7                       | 138,093                 | 15                       | 64,443                   | 3,505,600                       | 64                |
| 1977/78              | 2,138,088          | 44                      | 48,593                  | 337                      | 6,344                    | 1,003,116          | 8                       | 125,390                 | 103                      | 9,739                    | 3,141,204                       | 52                |
| 1978/79              | 1,559,769          | 38                      | 41,047                  | 313                      | 4,983                    | 1,691,941          | 15                      | 112,796                 | 107                      | 15,813                   | 3,251,710                       | 53                |
| 1979/80              | 1,781,923          | 53                      | 33,621                  | 355                      | 5,020                    | 2,427,860          | 23                      | 105,559                 | 114                      | 21,297                   | 4,209,783                       | 76                |
| 1980/81              | 2,010,832          | 58                      | 34,670                  | 418                      | 4,811                    | 638,063            | 14                      | 45,576                  | 84                       | 7,596                    | 2,648,895                       | 72                |
| 1981/82              | 3,306,990          | 74                      | 44,689                  | 443                      | 7,465                    | 71,302             | 7                       | 10,186                  | 32                       | 2,228                    | 3,378,292                       | 81                |
| 1982/83              | 1,208,042          | 97                      | 12,454                  | 181                      | 6,674                    | 150,684            | 10                      | 15,068                  | 55                       | 2,740                    | 1,358,726                       | 107               |
| 1983/84              | 1,629,076          | 104                     | 15,664                  | 338                      | 4,820                    | 11,142             | 4                       | 2,786                   | 13                       | 857                      | 1,640,218                       | 108               |
| 1984/85              | 1,125,903          | 85                      | 13,246                  | 269                      | 4,186                    | 3,665              | 5                       | 733                     | 15                       | 244                      | 1,129,568                       | 90                |
| 1985/86              | 997,306            | 84                      | 11,873                  | 320                      | 3,117                    | 2,379              | 4                       | 595                     | 9                        | 264                      | 999,685                         | 88                |
| 1986/87              | 1,159,685          | 73                      | 15,886                  | 271                      | 4,279                    | *                  | *                       | *                       | 9                        | *                        | 1,159,685                       | 73                |
| 1987/88 <sup>1</sup> | 1,306,202          | 69                      | 18,930                  | 308                      | 4,241                    | *                  | *                       | *                       | *                        | *                        | 1,306,202                       | 69                |

<sup>1</sup> Most recent year's data should be considered preliminary.

\* Where numbers of vessels participating is three or less, information is confidential.

Table 2. Statistical Area D (Yakutat) Tanner crab, harvest in thousands of pounds by district and season, 1968 to present.

| Season               | Sept   | Oct    | Nov    | Dec    | Jan    | Feb   | Mar         | Apr   |
|----------------------|--------|--------|--------|--------|--------|-------|-------------|-------|
| 1968                 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0         | 0.0   |
| 1969                 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0         | 0.0   |
| 1970                 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0         | 0.0   |
| 1971                 | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0         | 0.0   |
| 1972                 | 0.0    | *      | *      | 0.0    | 0.0    | 0.0   | 0.0         | *     |
| 1973/74              | 0.0    | 0.0    | 0.0    | 0.0    | 2.6    | 7.7   | 313.8       | 990.2 |
| 1974/75              | 0.0    | 0.0    | 0.0    | 0.0    | 27.0   | 32.3  | 592.1       | 839.4 |
| 1975/76              | 0.0    | 0.0    | 0.0    | 48.4   | 184.6  | 276.7 | 661.8       | 456.7 |
| 1976/77              | 0.0    | 0.0    | 0.0    | 0.0    | 2.1    | 343.2 | 486.1       | 135.3 |
| 1977/78              | 0.0    | 3.0    | 14.5   | 31.6   | 161.7  | 206.0 | 254.2       | 279.0 |
| 1978/79              | 2.1    | 0.2    | 0.0    | 23.8   | 63.7   | 185.1 | 412.8       | 766.3 |
| 1979/80              | 0.0    | 10.2   | 16.4   | 27.9   | 56.9   | 522.2 | 1,218.6     | 575.6 |
| 1980/81              | 0.0    | 0.0    | 0.0    | 1.0    | 6.2    | 181.9 | 389.6       | 59.5  |
| 1981/82              | Closed | Closed | Closed | Closed | 0.0    | 0.0   | 16.4        | 47.1  |
| 1982/83              | Closed | Closed | Closed | Closed | Closed | 50.2  | 73.5        | 27.0  |
| 1983/84              | Closed | Closed | Closed | Closed | Closed | 1.7   | 5.8         | 3.6   |
| 1984/85              | Closed | Closed | Closed | Closed | 0.0    | 0.0   | 0.0         | 3.7   |
| 1985/86              | Closed | Closed | Closed | Closed | 0.3    | 0.6   | 1.1         | 0.4   |
| 1986/87              | Closed | Closed | Closed | Closed | 0.0    | *     | *           | *     |
| 1987/88 <sup>1</sup> | Closed | Closed | Closed | Closed | 0.0    | *     | In Progress |       |

<sup>1</sup> Most recent year's data should be considered preliminary.

\* Where number of vessels participating is three or less, information is confidential.



Table 3. Statistical Area D (Yakutat) Tanner crab, harvest in thousands of pounds by district and season, 1968/69 to present.

| Season               | District           |         |       |       |       | Total   |
|----------------------|--------------------|---------|-------|-------|-------|---------|
|                      | 181                | 183     | 184   | 186   | 191   |         |
| 1968/69              | 0.0                | 0.0     | 0.0   | 0.0   | 0.0   | 0.0     |
| 1969/70              | 0.0                | 0.0     | 0.0   | 0.0   | 0.0   | 0.0     |
| 1970/71              | 0.0                | 0.0     | 0.0   | 0.0   | 0.0   | 0.0     |
| 1971/72              | 0.0                | 0.0     | 0.0   | 0.0   | 0.0   | 0.0     |
| 1972/73              | 2.9                | 102.2   | 12.8  | 104.6 | 0.0   | 222.5   |
| 1973/74              | 619.4              | 518.6   | 215.6 | 518.3 | 0.0   | 1,871.9 |
| 1974/75              | 1,135.1            | 193.7   | 118.7 | 97.2  | 428.0 | 1,972.7 |
| 1975/76              | 159.8              | 245.0   | 464.6 | 753.1 | 140.0 | 1,762.5 |
| 1976/77              | 0.0                | 452.7   | 167.8 | 346.2 | 0.0   | 966.7   |
| 1977/78              | 0.0                | 1,003.1 | 0.0   | 0.0   | 0.0   | 1,003.1 |
| 1978/79              | 0.0                | 350.9   | 589.2 | 207.9 | 544.0 | 1,692.0 |
| 1979/80              | 718.7              | 216.0   | 198.3 | 456.7 | 838.2 | 2,427.9 |
| 1980/81              | 20.3               | 156.1   | 122.8 | 78.1  | 260.7 | 638.0   |
| 1981/82              | 0.0                | 51.2    | 0.0   | 0.0   | 20.1  | 71.3    |
| 1982/83              | 60.7               | 83.3    | 1.6   | 0.5   | 4.5   | 150.6   |
| 1983/84              | 0.0                | 11.1    | 0.0   | 0.0   | 0.0   | 11.1    |
| 1984/85              | 0.0                | 3.7     | 0.0   | 0.0   | 0.0   | 3.7     |
| 1985/86              | 0.0                | 2.4     | 0.0   | 0.0   | 0.0   | 2.4     |
| 1986/87              | 0.0                | *       | 0.0   | *     | 0.0   | *       |
| 1987/88 <sup>1</sup> | Season in Progress |         |       |       |       |         |

<sup>1</sup> Most recent year's data should be considered preliminary.

\* Where number of vessels participating is three or less, information is confidential.

Table 4. Statistical Area A (Southeast Alaska) Tanner crab, harvest in thousands of pounds by district and season, 1968/69 to present.

| Season               | District |     |      |      |      |       |      |       |      |       |       |      |       |         |       |       | TOTAL   |
|----------------------|----------|-----|------|------|------|-------|------|-------|------|-------|-------|------|-------|---------|-------|-------|---------|
|                      | 1        | 2   | 3    | 4    | 5    | 6     | 7    | 8     | 9    | 10    | 11    | 12   | 13    | 14      | 15    | 16    |         |
| 1968/69              | 0.0      | 0.0 | 0.0  | 0.0  | 0.0  | 0.0   | 0.6  | 82.6  | 2.1  | 63.1  | 9.2   | 0.0  | 8.0   | 4.8     | 5.8   | 0.0   | 176.3   |
| 1969/70              | 0.0      | 0.0 | 0.0  | 0.0  | 0.0  | 0.7   | 0.0  | 78.4  | 0.0  | 179.0 | 227.6 | 4.8  | 28.6  | 96.9    | 44.4  | 0.0   | 660.3   |
| 1970/71              | 0.0      | 0.0 | 0.0  | 0.0  | 0.0  | 0.0   | 0.0  | 43.3  | 31.7 | 0.6   | 75.7  | 2.9  | 10.6  | 0.0     | 2.6   | 0.0   | 167.4   |
| 1971/72              | 0.0      | 0.0 | 0.0  | 0.0  | 0.0  | 0.6   | 0.0  | 71.6  | 30.9 | 69.6  | 71.0  | 0.4  | 99.7  | 310.8   | 2.0   | 0.0   | 656.7   |
| 1972/73              | 0.0      | 0.0 | 0.0  | 0.0  | 0.0  | 37.5  | 0.0  | 69.2  | 37.3 | 55.0  | 436.9 | 23.3 | 58.3  | 505.2   | 59.6  | 318.4 | 1,600.7 |
| 1973/74              | 0.0      | 0.0 | 0.0  | 0.0  | 0.3  | 18.8  | 4.2  | 23.1  | 46.1 | 132.8 | 616.2 | 1.7  | 60.8  | 404.3   | 1.5   | 0.0   | 1,309.7 |
| 1974/75              | 3.5      | 0.0 | 0.0  | 0.0  | 0.0  | 0.9   | 10.6 | 22.0  | 40.0 | 67.3  | 211.2 | 3.6  | 100.7 | 371.1   | 8.4   | 24.4  | 863.8   |
| 1975/76              | 0.0      | 0.0 | 0.0  | 0.0  | 14.3 | 2.8   | 11.3 | 112.8 | 98.9 | 138.0 | 828.6 | 92.5 | 176.3 | 505.1   | 168.8 | 0.0   | 2,149.4 |
| 1976/77              | 0.0      | 0.0 | 0.2  | 0.0  | 71.8 | 115.3 | 0.0  | 104.0 | 62.6 | 217.5 | 694.4 | 52.7 | 91.2  | 1,015.6 | 113.6 | 0.0   | 2,539.0 |
| 1977/78              | 3.9      | 0.0 | 17.0 | 0.0  | 0.3  | 124.6 | 0.0  | 60.1  | 6.7  | 212.6 | 580.3 | 96.6 | 86.4  | 758.6   | 190.9 | 0.0   | 2,138.1 |
| 1978/79              | 2.1      | 0.0 | 0.0  | 0.0  | 1.5  | 21.8  | 0.0  | 19.3  | 0.0  | 303.5 | 425.6 | 3.6  | 55.0  | 655.0   | 72.2  | 0.0   | 1,559.8 |
| 1979/80              | 0.0      | 0.0 | 0.0  | 0.0  | 0.0  | 5.9   | 15.6 | 118.2 | 24.8 | 237.2 | 749.4 | 22.0 | 33.3  | 399.5   | 125.6 | 50.4  | 1,781.9 |
| 1980/81              | 3.9      | 0.0 | 0.0  | 12.5 | 8.2  | 20.3  | 37.5 | 229.1 | 49.0 | 282.2 | 422.2 | 83.5 | 53.9  | 672.8   | 77.3  | 58.4  | 2,010.8 |
| 1981/82              | 0.9      | 0.0 | 0.0  | 0.0  | 0.0  | 121.4 | 41.8 | 201.2 | 0.1  | 167.4 | 405.0 | 78.5 | 66.0  | 2,102.6 | 122.2 | 0.0   | 3,307.0 |
| 1982/83              | 0.5      | 0.0 | 0.0  | 0.0  | 3.1  | 45.2  | 0.0  | 0.0   | 6.4  | 171.3 | 108.0 | 26.3 | 0.4   | 820.9   | 25.9  | 0.0   | 1,208.0 |
| 1983/84              | 0.0      | 0.0 | 0.0  | 0.1  | 14.7 | 42.0  | 29.1 | 46.4  | 28.9 | 205.4 | 375.0 | 23.4 | 62.6  | 653.4   | 145.8 | 2.2   | 1,629.1 |
| 1984/85              | 0.3      | 0.0 | 0.0  | 0.0  | 0.9  | 7.8   | 14.3 | 40.6  | 37.8 | 136.7 | 368.3 | 66.9 | 45.4  | 224.1   | 182.8 | 0.0   | 1,125.9 |
| 1985/86              | 3.3      | 0.0 | 0.0  | 0.0  | 1.7  | 16.7  | 3.7  | 22.4  | 12.1 | 74.9  | 475.7 | 39.7 | 47.1  | 182.3   | 117.8 | 0.0   | 997.3   |
| 1986/87              | 0.0      | 0.0 | 0.0  | 0.0  | 1.1  | 31.5  | 0.0  | 40.2  | 32.7 | 81.0  | 562.6 | 34.6 | 44.2  | 241.9   | 80.4  | 9.6   | 1,159.7 |
| 1987/88 <sup>1</sup> | *        | 0.0 | 0.0  | 0.0  | *    | 40.6  | *    | 30.8  | 22.9 | 220.3 | 531.8 | 59.4 | *     | 227.2   | 126.4 | *     | 1,306.2 |

<sup>1</sup> Most recent year's data should be considered preliminary.

\* Where number of vessels participating is three or less, information is confidential.

Table 5. Statistical Area A (Southeast Alaska) Tanner crab, harvest in thousands of pounds, by month and season, 1968/69 to present.

| Season               | Sep           | Oct   | Nov   | Dec     | Jan   | Feb   | Mar   | Apr   | May   | Jun           | Jul  | Aug | Total   |
|----------------------|---------------|-------|-------|---------|-------|-------|-------|-------|-------|---------------|------|-----|---------|
| 1968/69              | 0.0           | 0.0   | 0.0   | 0.0     | 10.0  | 6.7   | 13.1  | 60.4  | 35.0  | 34.2          | 8.2  | 8.6 | 176.3   |
| 1969/70              | 24.4          | 30.6  | 17.5  | 18.7    | 19.7  | 97.2  | 214.4 | 149.6 | 21.1  | 27.1          | 32.5 | 7.5 | 660.3   |
| 1970/71              | 0.9           | 1.5   | 6.7   | 7.1     | 21.3  | 41.4  | 56.2  | 32.2  | 0.0   | 0.0           | 0.0  | 0.0 | 167.4   |
| 1971/72              | 0.0           | 29.9  | 31.0  | 39.0    | 29.4  | 17.9  | 91.6  | 203.5 | 148.5 | 58.5          | 6.3  | 1.0 | 656.7   |
| 1972/73              | 5.4           | 42.0  | 83.8  | 86.7    | 50.7  | 140.8 | 376.6 | 554.6 | 228.7 | 26.6          | 4.1  | 0.8 | 1,600.7 |
| 1973/74              | 29.4          | 91.8  | 94.8  | 87.3    | 69.5  | 126.3 | 314.7 | 406.2 | 89.8  | 0.0           | 0.0  | 0.0 | 1,309.7 |
| 1974/75              | 4.3           | 77.2  | 70.6  | 56.6    | 71.6  | 74.4  | 180.6 | 225.8 | 102.6 | Season Closed |      |     | 863.8   |
| 1975/76              | 13.3          | 110.3 | 125.4 | 107.1   | 159.7 | 367.4 | 634.6 | 460.0 | 171.5 |               |      |     | 2,149.4 |
| 1976/77              | 3.9           | 76.1  | 262.2 | 203.2   | 337.0 | 393.4 | 693.1 | 457.9 | 112.1 |               |      |     | 2,539.0 |
| 1977/78              | 29.4          | 160.8 | 138.9 | 175.1   | 149.8 | 303.6 | 592.1 | 588.5 |       |               |      |     | 2,138.1 |
| 1978/79              | 6.6           | 47.6  | 76.7  | 91.7    | 200.1 | 189.2 | 465.4 | 422.3 | 60.3  |               |      |     | 1,559.8 |
| 1979/80              | 60.7          | 55.7  | 74.5  | 61.0    | 153.9 | 440.0 | 607.2 | 282.4 | 37.5  |               |      |     | 1,781.9 |
| 1980/81              | 33.7          | 51.9  | 48.5  | 60.1    | 315.9 | 494.9 | 627.3 | 350.5 | 28.1  |               |      |     | 2,010.8 |
| 1981/82              | Season Closed |       |       | 870.8   | 597.7 | 708.9 | 809.4 | 315.2 |       |               |      |     | 3,307.0 |
| 1982/83              |               |       |       | 1,208.0 |       |       |       |       |       |               |      |     | 1,208.0 |
| 1983/84              |               |       |       |         |       |       | 862.3 | 726.8 |       |               |      |     | 1,629.1 |
| 1984/85              |               |       |       |         |       |       | 531.3 | 593.0 |       |               |      |     | 1,125.9 |
| 1985/86              |               |       |       |         |       |       | 565.8 | 425.9 | 2.6   | 0.0           |      |     | 997.3   |
| 1986/87              |               |       |       |         |       |       | 634.2 | 525.5 |       |               |      |     | 1,159.7 |
| 1987/88 <sup>1</sup> |               |       |       |         |       |       | 765.6 | 540.6 |       |               |      |     | 1,306.2 |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 6. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) Tanner crab, commercial dockside size frequency sampling summary by size class in percent of sample, 1968/69 season to present.

| SOUTHEAST |       |           |       |                              |                   |                |
|-----------|-------|-----------|-------|------------------------------|-------------------|----------------|
| Season    | 139mm | 140-166mm | 167mm | Average<br>Carapace<br>Width | Number<br>Samples | Sample<br>Size |
| 1968/69   | 7.3   | 59.8      | 32.9  | 160.2                        | 8                 | 632            |
| 1969/70   | 9.3   | 72.4      | 18.3  | 155.1                        | 10                | 1,574          |
| 1970/71   | 12.1  | 71.0      | 16.9  | 153.2                        | 8                 | 489            |
| 1971/72   | 28.8  | 61.5      | 8.8   | 146.8                        | 3                 | 351            |
| 1972/73   | 20.3  | 64.9      | 14.7  | 151.4                        | 8                 | 1,032          |
| 1973/74   | 16.7  | 65.7      | 17.6  | 152.8                        | 9                 | 1,636          |
| 1974/75   | 6.2   | 67.7      | 26.1  | 157.9                        | 5                 | 514            |
| 1975/76   | 8.0   | 77.3      | 14.7  | 154.1                        | 14                | 1,657          |
| 1976/77   | 4.3   | 80.1      | 14.8  | 154.4                        | 29                | 3,838          |
| 1977/78   | 4.3   | 80.4      | 15.3  | 155.4                        | 38                | 4,881          |
| 1978/79   | 3.5   | 82.9      | 13.6  | 154.7                        | 29                | 3,277          |
| 1979/80   | 2.9   | 84.5      | 12.6  | 154.7                        | 45                | 4,834          |
| 1980/81   | 4.3   | 87.5      | 8.1   | 150.9                        | 43                | 4,089          |
| 1981/82   | 10.5  | 84.3      | 5.2   | 149.7                        | 62                | 6,758          |
| 1982/83   | 4.4   | 87.9      | 7.7   | 151.3                        | 58                | 5,918          |
| 1983/84   | 2.4   | 92.9      | 4.8   | 151.8                        | 26                | 2,687          |
| 1984/85   | 5.5   | 77.1      | 17.4  | 155.3                        | 13                | 415            |
| 1985/86   | 6.2   | 86.0      | 7.8   | 154.7                        | 51                | 5,453          |
| 1986/87   | 5.3   | 86.5      | 8.2   | 154.8                        | 61                | 6,834          |
| 1987/88   | 6.4   | 87.9      | 5.7   | 150.8                        | 56                | 9,936          |

| YAKUTAT |                  |           |       |                              |                   |                |
|---------|------------------|-----------|-------|------------------------------|-------------------|----------------|
| Season  | 139mm            | 140-166mm | 167mm | Average<br>Carapace<br>Width | Number<br>Samples | Sample<br>Size |
| 1973/74 | 42.6             | 56.8      | 0.5   | 144.8                        | 6                 | 1,480          |
| 1974/75 | 39.2             | 60.0      | 0.8   | 141.9                        | 5                 | 732            |
| 1975/76 | 45.2             | 52.3      | 2.5   | 140.8                        | 12                | 1,083          |
| 1976/77 | 16.4             | 82.0      | 1.6   | 146.6                        | 7                 | 880            |
| 1977/78 | 20.1             | 78.7      | 0.3   | 145.1                        | 11                | 2,273          |
| 1978/79 | 9.4              | 90.4      | 0.2   | 147.1                        | 17                | 1,723          |
| 1979/80 | 10.3             | 88.7      | 1.0   | 147.5                        | 23                | 2,396          |
| 1980/81 | 12.4             | 87.2      | 0.4   | 147.4                        | 23                | 2,604          |
| 1983/84 | No samples taken |           |       |                              |                   |                |
| 1984/85 | No samples taken |           |       |                              |                   |                |
| 1985/86 | No samples taken |           |       |                              |                   |                |
| 1986/87 | 15.7             | 84.3      | 0.0   | 146.6                        | 3                 | 396            |
| 1987/88 | 3.6              | 96.4      | 0.0   | 145.3                        | 1                 | 444            |

REPORT TO THE BOARD OF FISHERIES  
SOUTHEAST ALASKA (STATISTICAL AREA A)  
AND  
YAKUTAT (STATISITCAL AREA D)  
SHRIMP  
1987 / 1988

By  
Timothy Koeneman

Southeast Region  
Alaska Department of Fish and Game  
Division of Commercial Fisheries

April 1988

## TABLE OF CONTENTS

|                                       | <u>Page</u> |
|---------------------------------------|-------------|
| BAKCGROUND .....                      | 4.3         |
| Southeast Alaska Dungeness Crab ..... | 4.5         |
| Yakutat Dungeness Crab .....          | 4.7         |
| SEASON SUMMARY .....                  | 4.8         |
| Southeast Alaska Fishing Area .....   | 4.8         |
| Yakutat Area Fisheries .....          | 4.10        |
| ISSUES .....                          | 4.11        |

## LIST OF TABLES

| <u>Table</u>  | <u>Page</u> |
|---|-------------|
| 1. Statistical Area A (Southeast Alaska) dungeness catch, number of participating vessels, number of landings, and average catch per landing, 1960 to present ..... | 4.15        |
| 2a. Statistical Area A (Southeast Alaska) 1986/87 season; dungeness crab harvest by month and district .....  | 4.16        |
| 2b. Statistical Area A (Southeast Alaska) 1987/88 season; dungeness crab harvest by month and district .....  | 4.17        |
| 3. Statistical Area A (Southeast Alaska) dungeness crab catch in thousands of pounds by month and season, 1969/70 to present .....                                  | 4.18        |
| 4. Statistical Area D (Yakutat) dungeness crab catch, number of participating vessels, number of landings, and average catch per landing, 1960 to present .....     | 4.19        |
| 5. Statistical Area D (Yakutat) 1986/87 and 1987/88 seasons; dungeness crab harvest by month and district .....   | 4.20        |
| 6. Statistical Area D (Yakutat) dungeness crab catch in thousands of pounds by month and season, 1969/1970 to present .....   | 4.21        |
| 7. Statistical Area D (Yakutat) dungeness crab harvest in thousands of pounds by district and season, 1969/1970 to present .....                                    | 4.22        |
| 8. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) summary of commercial dockside samples of dungeness crab, 1976/77 season to present ..... | 4.23        |

## BACKGROUND

Dungeness crabs (*Cancer magister*), are members of the highly evolved brachyuran (true crab) subgroup of the order Crustacea. They are a highly prized, commercially significant species found in coastal waters from Baja to the Aleutian Islands. In terms of miles of coastline, about half the geographic range is in Alaska. They occur in commercially harvestable densities from San Francisco Bay to Kodiak Island, with nearly half of the United States harvest being taken in Alaskan waters in some years.

Historically, demand for Alaskan dungeness crab has been inversely related to the availability of crab from Washington, Oregon, and California. Low catches to the south prompted greater efforts in Alaska to fill the demand for product. Conversely, as long as cheaper crab were available, Alaskan crab was not competitive. As a result, during the late sixties and seventies, a period of high catches to the south, Alaskan dungeness crab stocks were not fully exploited.

The earlier dungeness crab fishery in this state was nearly self-policing. Numbers of fishermen were low enough so informal possession of personal fishing grounds was tacitly recognized. Enough unfished grounds existed so an operator encountering soft-shelled crabs or experiencing low catches in one area could easily move to alternative fishing areas. While demand remained low, restrictions to the fishery were largely unnecessary.

This pattern of fishing has undergone drastic change. Starting in the early eighties, the apparent decline of the dungeness fisheries of other Pacific Coast states has increased demand for the Alaskan product. Concurrently, gradual changes in the marketing practices for dungeness crab were occurring which also resulted in increased demand. The earlier practices of canning or freezing a meat pack were giving way to frozen sections and whole crab or transport of live crab to southern markets. Processors were more inclined to



handle dungeness crab, providing a market and support facilities for operators of dungeness vessels. Local availability of processing and shipping services, existence of a summer fishing season to supply the high-priced frozen-in-shell and live crab tourist-season markets in more southern ports, ease of entry into the fishery, and availability of crabs have all resulted in a more intense, competitive fishery. Informal arrangements and agreements for allocation of fishing grounds have eroded or vanished. All available fishing grounds and even marginal grounds are fully utilized by a fleet whose options no longer include relocation from areas of soft-shell crabs, mating crabs, or low catches to more suitable areas. The absence of self-management options has necessitated increased State involvement to control resource use and provide for continued harvest.

There is concern and controversy about the level of harvest which Southeast Alaskan and Yakutat dungeness stocks can tolerate. Much discussion involves the role of commercial harvest in the observed variability in stock abundance. That is, how much of the variability in the numbers of crab in a stock is due to fishing pressure and how much is due to natural factors? This is a question of some interest to both harvesters and managers because Alaska is the upper latitudinal limit of the range of the species and the factors which govern abundance can be expected to have more accentuated effects here than in more favorable parts of its range. Of particular concern is the severity and longevity of depressions in stock conditions. There is little experience of truly depressed conditions in these stocks with which to gauge the effectiveness of current management practices. However, the Yakutat stock will provide some insight in the next few years because it has now cycled through a period of low abundance following a period of high abundance characterized by one or two extremely strong year classes. The stock now appears to be rebuilding.

The Dungeness crab fisheries in Southeast Alaska and Yakutat, two distinctly different fishing areas, are managed separately by the same management staff. Statistical Area A includes the inner and outer waters of Southeast Alaska's Alexander Archipelago from Dixon Entrance to Cape Fairweather. Statistical

Area D includes coastal and estuarine waters between Cape Fairweather and Cape Suckling. It is commonly referred to as the Yakutat fishery.

### Southeast Alaska Dungeness Crab

Dungeness crab are harvested in Districts 1 through 16 in bay areas with mud or sand bottoms, generally at depths less than 15 fathoms. Since 1960, the harvests have averaged about 1.68 million pounds when annual (1960 to 1968) and seasonal (1969/70 to present) data are combined. Between the 1970/71 and 1980/81 seasons the catches averaged 0.60 million pounds. Since the 1981/82 season, catches have been at relatively high levels and have averaged 2.66 million pounds (Table 1). The most significant proportion of seasonal harvests have occurred from June through September (Table 3). Recent Board of Fisheries action has split the old season into June to August and October to February segments. The major harvests will probably be confined to the summer segment in the future, much as they have been concentrated during the summer months in the past. It is likely that effort will intensify in the summer to compensate for the shorter season. Winter fisheries are forced to contend with icing of bay fishing areas and inclement weather. A recent trend toward higher effort levels through the end of December has been accentuated by mild winters, strong markets, and the willingness of shore-based processors to handle crab late into the winter.

From the early 1930's through 1955, regulations included a prohibition on the taking of females, a minimum size limit for males, and a closed season on the most important grounds for two to four months between May 1 and September 1. Available documentation from that period indicates that the prevailing idea was that molting occurred during the summer. Research to specifically support this hypothesis has yet to be conducted. However, a limited amount of tagging work done in the early to mid-sixties suggested that the major molting period for male crab lasted from late winter through mid-summer. The same study suggested that females molt and mate through the summer months and carry eggs from September through March.

The summer closure was generally acceptable to the fishermen because other fishing opportunities such as salmon and halibut fisheries prevailed during the summer. The summer closure was revoked during the late 1950s. Until 1969 a prohibition on the taking of females, a minimum legal size for males, and a liberal limit on the units of gear were the only regulations governing the fishery.

Since the late 1960's, fishing season closures have been introduced, then modified to reduce fishing pressure during sensitive periods in the life history of the species. For example, prior to the 1976/77 season, a closure from March through May was established. The closure was based on limited data which indicated that it was an important molting period, particularly for male dungeness crabs.

In 1985, the latter half of August and the entire month of September were removed by regulation from the traditional season. A closure was instituted for this period because qualitative information suggests that it is the major mating period. This action was a further step in the gradual reduction of fishing time during periods that are believed to be important for the continued commercial viability of this species.

Considerable variability is evident in both the molting and mating periods of this species in Southeast Alaska. While the current closed seasons allow some protection during these periods, significant portions of both periods also occur during the current open season. The observed variability may be caused in part by local variations in such ecological factors as food availability and water temperature. The major concerns with fishing during sensitive life history periods are the mortalities associated with sorting soft-shelled crab during molting periods, the retention of light weight crab which have not totally regained prime condition, and the possible disruption of mating activities on subsequent stock reproduction. Effects of handling on subsequent recruitment are not currently quantifiable for Southeast Alaska stocks but are known to be significant in more southerly regions. It is likely that the effects of handling are accentuated in Southeast Alaska toward the northern periphery of the range of Dungeness crab.

The vessels in this fishery vary greatly in size and condition. The protected waters of the generally inshore fishery and the availability of numerous marketing opportunities and options allow a great variability in the condition and seaworthiness of vessels engaged in the fishery. Vessels generally range in size between small, outboard-powered skiffs and a few large Bering Sea-class crabbing vessels. However, most are below limit seiner (58 feet) lengths. The present 300 pot limit, discontinuous nature of crab habitat, and convenient support infrastructure in Southeast Alaska favor smaller vessels with lower operating expenses more than those typically fishing this species in the Pacific Northwest and the open water of the eastern Gulf of Alaska.

#### Yakutat Dungeness Crab

The average historic catch from the 1960 season through the present approximates 1.44 million pounds (Table 4). Historically, the largest proportion of the catch has been taken during the months of June and July even during those years when the fishery opened earlier and lasted longer than it currently does. (Table 6).

The dungeness fishery in the Yakutat area occurs primarily in the surf zone along the miles of productive sand and gravel beaches of the exposed outer coastline. The spits and channels that form at the mouths of rivers cutting through these beaches also provide good habitat for dungeness crab. Fishing occurs at depths between four and fifteen fathoms. Fishing along the beaches both east and west of Icy Bay has generally been exceptionally productive.

Environmental conditions along the outer coast appear to be more uniform than along the convoluted shorelines of Southeast Alaska. During the past four seasons, a somewhat regular pattern of male molting has occurred and enabled the Department to close broad portions or the entirety of the Yakutat Fishing

Area to protect molting crabs during this period. However, molting does not consistently occur during the same period each year and the relative numbers of males molting during the period varies from year to year. It is possible that molt timing and proportion of the stock affected by molting are related to the size and structure of the population and availability of food. Lower numbers of crabs may result in less competition for food and higher growth rates, which in turn result in more frequent, less predictable molting patterns.

The general class of vessels actively engaged in this fishery range in size from 40 to 60 feet. A few skiffs and larger vessels also usually enter the fishery each season. As a rule, the fleet is composed of sturdy vessels in good operating condition designed to be operated in near-shore rollers and capable of open ocean transit. The 600 pot limit, open ocean conditions encountered, and remote nature of the fishing grounds favor larger vessels typical of dungeness fisheries in the Pacific Northwest. In fact, most of the vessels fishing the more remote western and eastern grounds have home-ports in the Pacific Northwest.

During those seasons which are predicted by the industry to be especially productive, the fleet is often accompanied on the fishing grounds by tenders for the more distant processors. Occasionally, floating processors have been situated in Icy Bay to expedite handling and processing of crab.

## SEASON SUMMARY

### Southeast Alaska Fishing Area

The 1987/88 fishery was divided by regulation into two segments. The first lasted from June 15, 1987 through August 15, 1987. The second started on

October 1, 1987 and ended on February 28, 1988. Two hundred and thirty-nine vessels registered to enter the fishery this past season, compared to 240 that registered in 1986. Approximately 3.3 million pounds were landed. With an average value of about \$1.11 per pound, this catch was worth about \$3.68 million to the fishermen (ex-vessel price).

Districts 6, 8, and 14, each with over 500,000 pounds reported from them, accounted for about half the total catch. This is the same basic trend over the past few seasons. Seventy-two percent (2.39 million pounds) of the total catch was taken during the summer season. The winter season catch was 0.92 million pounds (Table 2b). This is the highest winter catch on record. Landings for the summer season were notable because they remained fairly stable through the open period. Weekly catch totals did not decline significantly over the length of the summer open period.

The reported incidence of soft-shell crab from some areas was high enough to be of concern. Although some effort was made to document the extent of the problem with on-board sampling, the information obtained was not sufficient to close specific areas nor the entirety of Statistical Area A. The incidence of soft-shell in some historically productive areas, notably around the Stikine River flats in District 8 and areas around Pleasant Island in District 14, immediately after the season opens does indicate that a June 15 opening may be too early in some areas during some years.

Dock-side sampling of dungeness crab was at the highest level in recent history, with 108 individual landings sampled. The average shoulder width of the 5,508 crab measured was 177.8 mm (7.0 inches). The average width of sampled crab has remained fairly constant during the past four seasons with season to season variations within 0.2 millimeters.

## Yakutat Area Fisheries

As in the Southeast Alaska fisheries, the 1987/88 fishery was divided into two segments. In the Yakutat fisheries, the summer segment extended from May 15 to July 15, 1987 and the winter segment opened on November 1, 1987 and closed on February 28, 1988. Vessels registered into this fishery numbered 30, eight more than in 1986/87.

Approximately 2.7 million pounds were landed. With an average value of \$1.10 per pound, this catch was worth about \$2.99 million to the fishermen (ex-vessel price).

Fishing patterns on the Yakutat grounds vary from season to season. This season, the most productive grounds were off Icy Bay where over 41 percent of the summer catch was reported from. District 181, fronting the Yakutat Forelands, District 184, fronting the Malaspina Glacier and the Yahtse River, and District 191, fronting the Yakataga Forelands between Icy Bay and Cape Yakataga, contributed about 20 percent each to the summer total. The summer season catch accounted for over 96 percent of the total season catch.

The summer season was notable for two major storms that struck the coast in fairly close succession and caused major gear loss for some vessels fishing the westward grounds. This was also the first year in several with fairly high harvest rates, at least at the beginning of the season. In the absence of tenders and with fisheries for other species crowding the only facility of significant size in Yakutat, some vessels were forced to wait longer than anticipated to off-load. Some deadloss reported for the summer season was probably attributable to this delay.

On-board and port sampling of dungeness crab during the summer segment of the 1987/88 season was not as extensive as in the prior two seasons. There were no tenders or floating processors in Icy Bay on which to base a sampler for on-board sampling of fishing vessels. As a result, only one short trip was

made to observe catch composition and assess the fishery operating on the Icy Bay and Yakutat grounds. Deliveries to the shore-based plant in Yakutat were not as convenient to sample as during the prior two seasons because the delivery schedules were much more flexible this season and landings occurred unpredictably. Moreover, travel budgets were more constrained. A total of 4,080 crab were sampled for width and shell condition. Crab from Districts 181 and 183 averaged 177.9 (7.0 inches) and 176.4 mm (6.9 inches) in shoulder width, respectively, markedly different from crab from the grounds west of Yakutat Bay where the shoulder widths of crabs from Districts 184, 186, and 191 averaged 183.2 mm (7.2 inches). This is the first season since the inception of the recent sampling program in 1980 that the difference in eastern grounds and western grounds crab have been this pronounced. Fishermen also noted that the catch declined at a notably faster rate in Districts 181 and 183 than the remaining western districts. As 77 percent of the catch for the combined seasons came from Districts 184, 186, and 191, the combined implication of the port-sampling observations and the catch information seems to be that the stocks on the eastern grounds were not as strong as those to the west. In the past, management has basically assumed that the entire Yakutat fishery operated on a fairly homogeneous, mixed stock. Data such as that collected during the 1987/88 season suggests otherwise.

## ISSUES

The dockside sampling program for dungeness crab continues to improve. The amount and quality of the information is getting consistently better as the staff becomes more familiar with the species and the fisheries. Particularly in the Yakutat fisheries, sampling is probably sufficient to provide a very good picture of the size composition and condition of the catch. Catch sampling is not as extensive in the Southeast Alaska fisheries because of the more diffuse nature of the fishery and the numerous marketing options



exercised by the many operators in the Southeast Alaska fishery. As a result, Southeast Alaska port landings are probably not sampled at the rate they should be nor are some districts sampled at rates comparable to their contribution to the catch. During the next season, more of an effort will be made to sample landings in the Southeast Alaska fisheries.

Limited on-board sampling was conducted by Department staff in Yakutat and Southeast Alaska. The data available from on-board sampling complements the port sampling information by providing insights into the meaning of the sizes and condition of crabs seen in the port samples. On-board sampling also provides size, condition, and relative abundance information on sublegal size males and females which do not normally appear in commercial landings. While increasing this segment of the sampling program is unlikely, it would provide more of the stock composition information that is necessary for management than port sampling alone can provide. Most notably, on-board sampling provides information on the extent of handling of soft-shelled crab and light-weight, low-condition crab that are sorted and discarded on the grounds. During this past season, on-board sampling has shown that the incidence of light crab can be extremely variable, with high levels commonly found in areas directly adjacent to areas with hard-shelled crab in good condition. As handling of soft-shelled and light crab is suspected to result in high levels of mortality to legal as well as sublegal and female crab, on-board observations are pivotal to formulation of appropriate management proposals to minimize this otherwise unquantified loss to the fishery and the resource.

The decision of the Commercial Fisheries Entry Commission to not limit the dungeness crab fisheries in Southeast Alaska while limiting entry into the Tanner and king crab fisheries will contribute to some undesirable short-term interest in dungeness crab. More vessels have entered the fishery each season since the 1981/82 season, partly in response to the perceived threat of limited entry to this fishery. Many people are attempting to establish a fishing history in order to qualify for permits in the event that the

dungeness fishery in Southeast Alaska is someday limited. For some newcomers, it is the only crab fishery that remains open to entry in Southeast Alaska because permits for Tanner and king crab are unavailable for purchase pending final assignment of limited entry permits by the Commercial Fisheries Entry Commission to current interim-use permit holders. It is likely that with the continued depressed nature of some lower West Coast dungeness stocks, high fishing pressure will continue on Southeast Alaska and Yakutat stocks. Prospects for declining catches in the Kodiak, Cook Inlet, and Aleutian dungeness crab fisheries will concentrate continued high effort in Southeast Alaska and Yakutat during the 1988/89 season.

In view of continued intensive exploitation of the dungeness crab resources in Southeast Alaska and Yakutat, the need to formulate management policies, frequently expressed in the past, continues to grow. It is evident from the consistent landings during the summer, when other fisheries are also occurring, that crab fishing is no longer a secondary fishery for a large number of fishermen. There is some indication that increasing numbers of vessels will fish the winter season in both Southeast Alaska and Yakutat. Additional adjustments of seasons toward autumn and winter months to provide more protection during sensitive molting and mating periods is probably feasible for the Southeast Alaska registration area. While being desirable, a similar shift in Yakutat may seriously curtail the fishery because of high seas generated by severe weather conditions during the autumn and winter. Recent exploratory efforts by some larger vessels indicate that while the crab can be harvested in winter, the severe weather increases gear loss and decreases fishing time and effective catch rate. Establishment of guideline harvest ranges for dungeness crab should allow managing for some stock retention during periods of abundance. This may lessen the magnitude of the depression of stocks which seems to occur after periods of high abundance and high harvest rates. This management scheme is not generally adhered to by managers of more southerly stocks of dungeness crab. There will also be some reluctance on the part of fishermen to be restricted to more inclement periods of the year when prices are depressed by landings from fisheries further south. However, management on the fringes of the species range seems

to rationally call for development and implementation of more conservative practices, including more curtailed summer seasons.

Based on field observations, catch statistics, vessel operator interviews, port and on-board sampling, and past historical data, the coming season in Southeast Alaska should produce approximately 2.5 million pounds. Yakutat should produce about 3.0 million pounds, with a potential of a higher catch due to anticipated increases in the number of vessels, processors, and gear this coming summer season. These are estimates, and should not be viewed as desired harvest levels or quotas.

Table 1. Statistical Area A (Southeast Alaska) dungeness catch, number of participating vessels, number of landings, and average catch per landing, 1960 to present.

| Year/Season          | Catch in Pounds | Number of Vessels | Pounds per Vessel | Number of Landings | Pounds per Landing |
|----------------------|-----------------|-------------------|-------------------|--------------------|--------------------|
| 1960                 | 1,449,405       | -                 |                   |                    |                    |
| 1961                 | 671,455         | -                 |                   |                    |                    |
| 1962                 | 2,985,939       | -                 |                   |                    |                    |
| 1963                 | 3,296,362       | -                 |                   |                    |                    |
| 1964                 | 3,996,100       | -                 |                   |                    |                    |
| 1965                 | 2,392,395       | -                 |                   |                    |                    |
| 1966                 | 1,968,117       | -                 |                   |                    |                    |
| 1967                 | 2,033,156       | -                 |                   |                    |                    |
| 1968                 | 1,900,690       | -                 |                   |                    |                    |
| 1969/70              | 1,149,111       | 20                | 57,456            | 392                | 2,931              |
| 1970/71              | 776,617         | 21                | 36,982            | 380                | 2,044              |
| 1971/72              | 451,281         | 23                | 19,621            | 315                | 1,433              |
| 1972/73              | 597,587         | 30                | 19,920            | 315                | 1,897              |
| 1973/74              | 748,519         | 41                | 18,257            | 483                | 1,550              |
| 1974/75              | 713,668         | 43                | 16,597            | 453                | 1,575              |
| 1975/76              | 611,621         | 36                | 16,989            | 346                | 1,768              |
| 1976/77              | 515,378         | 25                | 20,615            | 174                | 2,962              |
| 1977/78              | 127,201         | 12                | 10,600            | 87                 | 1,462              |
| 1978/79              | 749,683         | 25                | 29,987            | 207                | 3,622              |
| 1979/80              | 801,753         | 37                | 21,669            | 313                | 2,562              |
| 1980/81              | 512,247         | 26                | 19,702            | 226                | 2,267              |
| 1981/82              | 2,935,110       | 76                | 38,620            | 748                | 3,924              |
| 1982/83              | 3,646,882       | 128               | 28,491            | 1,306              | 2,792              |
| 1983/84              | 2,150,205       | 133               | 16,167            | 1,533              | 1,403              |
| 1984/85              | 1,833,250       | 179               | 10,242            | 1,564              | 1,172              |
| 1985/86              | 2,311,556       | 215               | 10,751            | 2,072              | 1,116              |
| 1986/87              | 2,454,434       | 222               | 11,056            | 2,327              | 1,055              |
| 1987/88 <sup>1</sup> | 3,314,385       | 233               | 14,225            | 2,949              | 1,124              |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 2a. Statistical Area A (Southeast Alaska) 1986/87 season; dungeness crab harvest by month and district.

| Dist. | 1986   |         |         |         |        |         |         |         | 1987   |        | Total     |
|-------|--------|---------|---------|---------|--------|---------|---------|---------|--------|--------|-----------|
|       | May    | June    | July    | Aug     | Sept   | Oct     | Nov     | Dec     | Jan    | Feb    |           |
| 101   | Closed | 0       | 0       | 0       | Closed | 19,640  | 14,866  | 8,672   | 7,139  | 3,527  | 53,844    |
| 102   | Closed | 0       | 0       | 0       | Closed | 423     | 0       | 0       | 0      | 0      | 423       |
| 103   | Closed | 1,566   | 1,307   | 4,112   | Closed | 0       | 724     | 3,306   | 0      | 0      | 11,015    |
| 104   | Closed | 0       | 150     | 848     | Closed | 0       | 0       | 0       | 0      | 0      | 998       |
| 105   | Closed | 12,640  | 41,425  | 14,525  | Closed | 21,414  | 3,713   | 2,264   | 1,889  | 255    | 98,125    |
| 106   | Closed | 65,210  | 114,184 | 62,645  | Closed | 58,453  | 23,854  | 14,500  | 4,248  | 8,836  | 351,930   |
| 107   | Closed | 9,317   | 20,491  | 16,244  | Closed | 14,071  | 10,725  | 5,103   | 3,224  | 4,354  | 83,529    |
| 108   | Closed | 44,862  | 115,841 | 58,568  | Closed | 58,024  | 36,710  | 16,409  | 5,715  | 16,231 | 352,360   |
| 109   | Closed | 9,891   | 100,818 | 56,422  | Closed | 33,064  | 31,813  | 13,715  | 10,658 | 1,567  | 257,948   |
| 110   | Closed | 22,214  | 124,983 | 80,380  | Closed | 52,863  | 23,264  | 7,275   | 2,043  | 2,616  | 315,638   |
| 111   | Closed | 4,424   | 10,619  | 5,591   | Closed | 4,236   | 506     | 461     | 613    | 958    | 27,408    |
| 112   | Closed | 23,494  | 62,883  | 30,118  | Closed | 33,442  | 20,153  | 4,231   | 0      | 0      | 174,321   |
| 113   | Closed | 17,413  | 48,854  | 15,596  | Closed | 11,068  | 4,590   | 2,134   | 0      | 0      | 99,655    |
| 114   | Closed | 42,958  | 120,678 | 75,750  | Closed | 138,212 | 76,972  | 13,391  | 694    | 2,410  | 471,065   |
| 115   | Closed | 11,296  | 16,082  | 5,885   | Closed | 2,189   | 305     | 322     | 0      | 0      | 36,079    |
| 116   | Closed | 4,784   | 17,610  | 19,587  | Closed | 13,624  | 26,256  | 8,497   | 21,844 | 7,894  | 120,096   |
| Total |        | 270,069 | 795,925 | 446,271 |        | 460,723 | 274,451 | 100,280 | 58,067 | 48,648 | 2,454,434 |

Table 2b. Statistical Area A (Southeast Alaska) 1987/88 season; dungeness crab harvest by month and district.

| Dist. | 1987   |         |           |         |        |         |         |        | <sup>1</sup><br>1988 |        | Total     |
|-------|--------|---------|-----------|---------|--------|---------|---------|--------|----------------------|--------|-----------|
|       | May    | June    | July      | Aug     | Sept   | Oct     | Nov     | Dec    | Jan                  | Feb    |           |
| 101   | Closed | 0       | 0         | 0       | Closed | 22,356  | 20,524  | 7,569  | 1,921                | 2,031  | 54,401    |
| 102   | Closed | 0       | 0         | 0       | Closed | 5,350   | 500     | 0      | 0                    | 0      | 5,850     |
| 103   | Closed | 0       | 2,831     | 1,082   | Closed | 426     | 5,831   | 980    | 543                  | 1,572  | 13,265    |
| 104   | Closed | 0       | 0         | 873     | Closed | 0       | 0       | 0      | 0                    | 0      | 873       |
| 105   | Closed | 22,655  | 61,590    | 19,589  | Closed | 21,898  | 15,950  | 2,840  | 4,337                | 0      | 148,859   |
| 106   | Closed | 103,499 | 146,844   | 59,926  | Closed | 123,536 | 44,788  | 12,408 | 8,723                | 4,471  | 504,195   |
| 107   | Closed | 14,919  | 21,319    | 6,529   | Closed | 9,046   | 10,604  | 3,414  | 3,521                | 0      | 69,352    |
| 108   | Closed | 114,873 | 177,089   | 103,011 | Closed | 66,815  | 40,032  | 12,229 | 6,874                | 330    | 521,253   |
| 109   | Closed | 75,017  | 124,347   | 51,997  | Closed | 23,430  | 13,801  | 4,321  | 929                  | 3,232  | 297,074   |
| 110   | Closed | 72,936  | 160,252   | 81,795  | Closed | 38,816  | 14,905  | 1,732  | 1,532                | 2,300  | 374,268   |
| 111   | Closed | 7,406   | 48,485    | 34,280  | Closed | 23,395  | 2,790   | 0      | 570                  | 184    | 117,110   |
| 112   | Closed | 23,443  | 77,843    | 32,464  | Closed | 11,039  | 1,893   | 0      | 0                    | 1,314  | 147,996   |
| 113   | Closed | 10,343  | 40,827    | 12,770  | Closed | 7,687   | 3,042   | 1,799  | 0                    | 0      | 76,468    |
| 114   | Closed | 69,572  | 207,240   | 141,479 | Closed | 88,182  | 29,968  | 5,219  | 3,075                | 6,799  | 551,534   |
| 115   | Closed | 15,611  | 5,805     | 1,502   | Closed | 6,854   | 624     | 104    | 175                  | 119    | 30,794    |
| 116   | Closed | 38,053  | 107,152   | 96,673  | Closed | 24,089  | 70,810  | 28,699 | 29,654               | 5,963  | 401,093   |
| Total |        | 568,327 | 1,181,624 | 643,970 |        | 472,919 | 276,062 | 81,314 | 61,854               | 28,315 | 3,314,385 |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 3. Statistical Area A (Southeast Alaska) dungeness crab catch in thousands of pounds by month and season, 1969/70 to present.

| Season               | Apr    | May    | June  | July    | Aug   | Sept   | Oct   | Nov   | Dec   | Jan  | Feb  | Mar    | Total   |
|----------------------|--------|--------|-------|---------|-------|--------|-------|-------|-------|------|------|--------|---------|
| 1969/70              | 21.3   | 84.9   | 201.0 | 217.5   | 225.5 | 210.9  | 106.2 | 47.3  | 14.2  | 5.0  | 7.1  | 8.1    | 1,149.1 |
| 1970/71              | 11.1   | 37.0   | 168.5 | 150.4   | 157.1 | 122.6  | 68.6  | 35.9  | 9.3   | 5.6  | 4.6  | 5.9    | 776.6   |
| 1971/72              | 7.4    | 27.4   | 43.6  | 97.8    | 79.3  | 88.9   | 63.3  | 23.3  | 9.5   | 7.0  | 1.8  | 2.2    | 451.3   |
| 1972/73              | 4.2    | 30.5   | 38.6  | 167.2   | 167.7 | 83.6   | 49.5  | 31.5  | 16.7  | 3.5  | 1.4  | 3.2    | 597.6   |
| 1973/74              | 16.9   | 40.9   | 142.4 | 205.8   | 129.3 | 87.3   | 71.6  | 27.5  | 8.8   | 3.5  | 4.7  | 9.9    | 748.5   |
| 1974/75              | 24.8   | 21.5   | 135.5 | 167.1   | 135.0 | 85.0   | 53.9  | 27.6  | 26.5  | 6.3  | 13.7 | 16.8   | 713.7   |
| 1975/76              | 18.1   | 35.9   | 110.2 | 136.8   | 120.8 | 82.8   | 49.7  | 25.9  | 11.7  | 6.9  | 2.9  | 9.9    | 611.6   |
| 1976/77              | Closed | Closed | 105.9 | 206.1   | 89.9  | 46.1   | 32.0  | 13.2  | 11.7  | 4.1  | 6.1  | Closed | 515.4   |
| 1977/78              | Closed | Closed | 2.3   | 8.5     | 29.6  | 31.4   | 15.9  | 25.0  | 6.2   | 0.5  | 8.0  | Closed | 127.2   |
| 1978/79              | Closed | Closed | 126.4 | 206.9   | 152.6 | 104.6  | 70.3  | 43.3  | 18.2  | 18.2 | 9.1  | Closed | 749.7   |
| 1979/80              | Closed | Closed | 165.7 | 184.6   | 137.0 | 137.5  | 75.1  | 52.1  | 30.1  | 12.7 | 6.9  | Closed | 801.8   |
| 1980/81              | Closed | Closed | 62.7  | 157.1   | 122.2 | 69.9   | 36.3  | 30.2  | 15.1  | 8.6  | 10.1 | Closed | 512.2   |
| 1981/82              | Closed | Closed | 460.6 | 899.5   | 560.3 | 427.1  | 292.9 | 164.2 | 67.7  | 28.4 | 33.9 | Closed | 2,934.6 |
| 1982/83              | Closed | Closed | 936.7 | 1,047.5 | 735.3 | 450.1  | 219.7 | 145.9 | 68.2  | 16.3 | 22.9 | Closed | 3,642.5 |
| 1983/84              | Closed | Closed | 772.0 | 451.0   | 334.5 | 267.5  | 146.5 | 84.4  | 45.8  | 30.9 | 14.7 | Closed | 2,147.4 |
| 1984/85              | Closed | Closed | 0.0   | 670.8   | 494.4 | 272.4  | 154.4 | 138.2 | 58.6  | 27.0 | 15.1 | Closed | 1,833.3 |
| 1985/86              | Closed | Closed | 362.5 | 847.8   | 438.5 | Closed | 379.6 | 177.6 | 55.5  | 29.7 | 20.1 | Closed | 2,311.6 |
| 1986/87              | Closed | Closed | 270.1 | 795.9   | 446.3 | Closed | 460.7 | 274.5 | 100.3 | 58.1 | 48.7 | Closed | 2,454.4 |
| 1987/88 <sup>1</sup> | Closed | Closed | 568.3 | 1,181.6 | 644.0 | Closed | 472.9 | 276.1 | 81.3  | 61.9 | 28.3 | Closed | 3,314.4 |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 4. Statistical Area D (Yakutat) dungeness crab catch, number of participating vessels, number of landings, and average catch per landing, 1960 to present.

| Year/Season | Catch in Pounds | Number of Vessels | Pounds per Vessel | Number of Landings | Pounds per Landing |
|-------------|-----------------|-------------------|-------------------|--------------------|--------------------|
| 1960        | 543,762         | -                 |                   |                    |                    |
| 1961        | 1,023,545       | -                 |                   |                    |                    |
| 1962        | 937,051         | -                 |                   |                    |                    |
| 1963        | 1,383,298       | -                 |                   |                    |                    |
| 1964        | 637,140         | -                 |                   |                    |                    |
| 1965        | 910,278         | -                 |                   |                    |                    |
| 1966        | 528,060         | -                 |                   |                    |                    |
| 1967        | 2,031,460       | -                 |                   |                    |                    |
| 1968        | 2,096,119       | -                 |                   |                    |                    |
| 1969/70     | 1,207,397       | -                 |                   | 107                | 11,284             |
| 1970/71     | 1,508,561       | -                 |                   | 83                 | 18,175             |
| 1971/72     | 1,212,198       | -                 |                   | 88                 | 13,775             |
| 1972/73     | 1,992,574       | -                 |                   | 85                 | 23,442             |
| 1973/74     | 2,347,752       | -                 |                   | 236                | 9,948              |
| 1974/75     | 1,031,573       | -                 |                   | 154                | 6,699              |
| 1975/76     | 579,908         | 17                | 34,112            | 113                | 5,132              |
| 1976/77     | 529,470         | 7                 | 75,639            | 28                 | 18,910             |
| 1977/78     | 116,052         | -                 |                   | 11                 | 10,550             |
| 1978/79     | 1,799,403       | 12                | 149,950           | 122                | 14,749             |
| 1979/80     | 1,436,923       | 21                | 68,425            | 87                 | 16,516             |
| 1980/81     | 883,633         | 11                | 80,330            | 63                 | 14,026             |
| 1981/82     | 3,228,301       | 28                | 115,296           | 169                | 19,102             |
| 1982/83     | 5,158,111       | 35                | 147,375           | 305                | 16,912             |
| 1983/84     | 2,663,520       | 67                | 39,754            | 458                | 5,816              |
| 1984/85     | 773,356         | 39                | 19,830            | 227                | 3,407              |
| 1985/86     | 371,114         | 32                | 11,597            | 168                | 2,209              |
| 1986/87     | 757,257         | 22                | 34,421            | 112                | 6,761              |
| 1987/88     | 2,714,534       | 28                | 96,948            | 188                | 14,439             |

<sup>1</sup> Most recent year's data should be considered preliminary.



Table 5. Statistical Area D (Yakutat) 1986/87 and 1987/88 seasons; dungeness crab harvest by month and district.

| District | 1986    |         |         |     |               |     |        |        | 1987  |     | Total   |
|----------|---------|---------|---------|-----|---------------|-----|--------|--------|-------|-----|---------|
|          | May     | June    | July    | Aug | Sept          | Oct | Nov    | Dec    | Jan   | Feb |         |
| 181      | 47,973  | 127,574 | 69,998  |     |               |     | 0      | 0      | 0     | 0   | 245,545 |
| 183      | 749     | 27,900  | 1,435   |     |               |     | 886    | 16,582 | 1,294 | 996 | 49,842  |
| 184      | 221     | 10,432  | 5,663   |     | Season Closed |     | 0      | 0      | 0     | 0   | 16,316  |
| 186      | 123,975 | 199,289 | 22,667  |     |               |     | 23,938 | 0      | 0     | 0   | 369,869 |
| 191      | 22,319  | 30,142  | 23,224  |     |               |     | 0      | 0      | 0     | 0   | 75,685  |
| Total    | 195,237 | 395,337 | 122,987 |     |               |     | 24,824 | 16,582 | 1,294 | 996 | 757,257 |

| District | 1987    |           |         |     |               |     |        |        | <sup>1</sup> 1988 |        | Total     |
|----------|---------|-----------|---------|-----|---------------|-----|--------|--------|-------------------|--------|-----------|
|          | May     | June      | July    | Aug | Sept          | Oct | Nov    | Dec    | Jan               | Feb    |           |
| 181      | 182,009 | 272,546   | 86,656  |     |               |     | 2,067  | 9,564  | 8,326             | 504    | 561,672   |
| 183      | 17,131  | 19,165    | 291     |     |               |     | 6,340  | 574    | 148               | 1,048  | 44,697    |
| 184      | 200,270 | 281,619   | 62,816  |     | Season Closed |     | 0      | 0      | 0                 | 0      | 544,705   |
| 186      | 434,310 | 561,185   | 80,421  |     |               |     | 30,480 | 16,889 | 0                 | 0      | 1,123,285 |
| 191      | 12,885  | 145,455   | 244,369 |     |               |     | 0      | 16,890 | 0                 | 20,576 | 440,175   |
| Total    | 846,605 | 1,279,970 | 474,553 |     |               |     | 38,887 | 43,917 | 8,474             | 22,128 | 2,714,534 |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 6. Statistical Area D (Yakutat) dungeness crab catch in thousands of pounds by month and season, 1969/1970 to present.

| Season               | Apr    | May    | June    | July    | Aug    | Sept   | Oct    | Nov    | Dec    | Jan    | Feb    | Total   |
|----------------------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|--------|---------|
| 1969/70              | 0.0    | 87.7   | 254.7   | 529.0   | 336.1  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1,207.4 |
| 1970/71              | 0.0    | 40.3   | 386.6   | 426.1   | 511.9  | 143.6  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1,508.6 |
| 1971/72              | 0.0    | 8.6    | 407.8   | 572.4   | 223.4  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1,212.2 |
| 1972/73              | 0.0    | 100.7  | 653.7   | 842.1   | 392.7  | 3.4    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1,992.6 |
| 1973/74              | 18.5   | 205.4  | 679.7   | 1,079.5 | 195.2  | 88.3   | 80.9   | 0.0    | 0.0    | 0.0    | 0.3    | 2,347.8 |
| 1974/75              | 16.3   | 141.0  | 476.0   | 213.3   | 113.3  | 37.4   | 34.3   | 0.0    | 0.0    | 0.0    | 0.0    | 1,031.6 |
| 1975/76              | Closed | 84.3   | 239.5   | 256.1   | Closed | Closed | Closed | Closed | Closed | Closed | Closed | 579.9   |
| 1976/77              | Closed | Closed | 132.2   | 234.3   | 163.0  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 529.5   |
| 1977/78              | Closed | Closed | 0.0     | 0.0     | 33.7   | 72.9   | 0.0    | 1.6    | 0.6    | 7.2    | 0.0    | 116.1   |
| 1978/79              | Closed | Closed | 738.1   | 816.3   | 245.0  | Closed | Closed | Closed | Closed | Closed | Closed | 1,799.4 |
| 1979/80              | Closed | Closed | 840.1   | 563.9   | 32.9   | Closed | Closed | Closed | Closed | Closed | Closed | 1,436.9 |
| 1980/81              | Closed | Closed | 404.4   | 318.3   | 139.6  | 18.7   | 0.5    | 0.0    | 0.0    | 0.5    | 1.5    | 883.6   |
| 1981/82              | Closed | Closed | 2,467.7 | 634.9   | 125.7  | Closed | Closed | Closed | Closed | Closed | Closed | 3,228.3 |
| 1982/83              | Closed | 0.0    | 3,090.9 | 1,856.6 | 210.7  | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 5,158.1 |
| 1983/84              | Closed | 969.1  | 1,197.4 | 201.7   | 42.6   | 183.2  | 55.8   | 2.6    | 5.6    | 2.6    | 2.9    | 2,663.5 |
| 1984/85              | Closed | 402.8  | 316.5   | 54.1    | Closed | Closed | Closed | 0.0    | 0.0    | 0.0    | 0.0    | 773.4   |
| 1985/86              | Closed | 158.2  | 160.5   | 49.1    | Closed | Closed | Closed | 1.3    | 1.0    | 0.6    | 0.5    | 371.1   |
| 1986/87              | Closed | 195.2  | 395.3   | 123.0   | Closed | Closed | Closed | 24.8   | 16.6   | 1.3    | 1.0    | 757.3   |
| 1987/88 <sup>1</sup> | Closed | 846.6  | 1,280.0 | 474.6   | Closed | Closed | Closed | 38.9   | 43.9   | 8.5    | 22.1   | 2,686.2 |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 7. Statistical Area D (Yakutat) dungeness crab harvest in thousands of pounds, by district and season, 1969/70 to present.

| Season               | District |       |         |         |         | Total   |
|----------------------|----------|-------|---------|---------|---------|---------|
|                      | 181      | 183   | 184     | 186     | 191     |         |
| 1969/70              | 0.0      | 481.3 | 18.9    | 442.5   | 264.7   | 1,207.4 |
| 1970/71              | 362.4    | 6.0   | 58.0    | 370.9   | 711.2   | 1,508.5 |
| 1971/72              | 405.3    | 133.7 | 276.1   | 355.5   | 41.6    | 1,212.2 |
| 1972/73              | 879.0    | 52.0  | 273.5   | 727.8   | 60.4    | 1,992.7 |
| 1973/74              | 950.8    | 108.0 | 306.5   | 652.8   | 329.7   | 2,347.8 |
| 1974/75              | 182.8    | 35.0  | 237.7   | 514.6   | 61.5    | 1,031.6 |
| 1975/76              | 166.8    | 28.3  | 81.7    | 283.2   | 19.9    | 579.9   |
| 1976/77              | 67.3     | 37.7  | 63.3    | 361.3   | 0.0     | 529.6   |
| 1977/78              | 0.0      | 9.4   | 0.0     | 106.6   | 0.0     | 116.0   |
| 1978/79              | 426.2    | 209.2 | 289.7   | 797.9   | 76.4    | 1,799.4 |
| 1979/80              | 201.2    | 108.6 | 218.3   | 599.2   | 309.7   | 1,437.0 |
| 1980/81              | 243.2    | 72.3  | 20.1    | 425.0   | 123.0   | 883.6   |
| 1981/82              | 829.3    | 237.3 | 681.7   | 994.0   | 485.9   | 3,228.2 |
| 1982/83              | 691.5    | 404.2 | 1,715.0 | 784.5   | 1,563.0 | 5,158.2 |
| 1983/84              | 774.8    | 333.5 | 499.6   | 714.5   | 341.2   | 2,663.6 |
| 1984/85              | 249.0    | 135.6 | 53.6    | 306.4   | 28.7    | 773.3   |
| 1985/86              | 138.5    | 78.8  | 17.9    | 112.2   | 23.7    | 371.1   |
| 1986/87              | 245.5    | 49.8  | 16.3    | 369.9   | 75.7    | 757.2   |
| 1987/88 <sup>1</sup> | 561.7    | 44.7  | 544.7   | 1,123.3 | 440.2   | 2,714.6 |

<sup>1</sup> Most recent year's data should be considered preliminary

Table 8. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) summary of commercial dockside samples of dungeness crab, 1976/77 season to present.

| Southeast Fishery                 | 1976<br>1977 | 1977<br>1978 | 1978<br>1979 | 1979<br>1980 | 1980<br>1981 | 1981<br>1982 | 1982<br>1983 | 1983<br>1984 | 1984<br>1985 | 1985<br>1986 | 1986<br>1987 | 1987<br>1988 <sup>1</sup> |
|-----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------------|
| No. of samples                    | 3            | 6            | 11           | 4            | 5            | 7            | 9            | 10           | 3            | 24           | 29           | 56                        |
| No. of crab<br>measured           | 295          | 624          | 1,124        | 420          | 445          | 715          | 840          | 1,103        | 302          | 2,414        | 2,906        | 5,508                     |
| Average shoulder<br>width, mm     | 177.7        | 178.7        | 180.0        | 181.2        | 180.6        | 184.0        | 187.0        | 186.5        | 175.9        | 175.2        | 180.2        | 177.8                     |
| Average shoulder<br>width, inches | 7.0          | 7.0          | 7.1          | 7.1          | 7.1          | 7.2          | 7.4          | 7.3          | 7.0          | 6.9          | 7.1          | 7.0                       |
| Range shoulder<br>width, mm       | 159-204      | 159-211      | 161-213      | 160-217      | 161-207      | 165-215      | 164-218      | 159-225      | 164-205      | 157-228      | 156-228      | 160-213                   |
| Yakutat Fishery                   | 1976<br>1977 | 1977<br>1978 | 1978<br>1979 | 1979<br>1980 | 1980<br>1981 | 1981<br>1982 | 1982<br>1983 | 1983<br>1984 | 1984<br>1985 | 1985<br>1986 | 1986<br>1987 | 1987<br>1988              |
| No. of samples                    | 3            | 2            | 27           | 3            | 2            | 10           | 16           | 31           | 41           | 61           | 30           | 27                        |
| No. of crab<br>measured           | 327          | 188          | 4,491        | 437          | 494          | 1,077        | 1,700        | 2,473        | 3,593        | 6,729        | 2,224        | 4,080                     |
| Average shoulder<br>width, mm     | 176.3        | 182.4        | 180.4        | 186.9        | 180.6        | 175.7        | 182.4        | 193.9        | 190.6        | 180.0        | 180.0        | 181.1                     |
| Average shoulder<br>width, inches | 6.9          | 7.2          | 7.1          | 7.4          | 7.1          | 6.9          | 7.2          | 7.6          | 7.5          | 7.1          | 7.1          | 7.1                       |
| Range shoulder<br>width, mm       | 157-207      | 161-211      | 156-221      | 166-221      | 161-215      | 160-218      | 158-222      | 163-231      | 162-232      | 156-226      | 158-226      | 159-224                   |

<sup>1</sup> Most recent year's data should be considered preliminary.

REPORT TO THE BOARD OF FISHERIES

1987/88 SOUTHEAST ALASKA & YAKUTAT (REGION I) SHELLFISH FISHERIES

By

Region I Staff

Southeast Region  
Alaska Department of Fish and Game  
Division of Commercial Fisheries

April 1988

## TABLE OF CONTENTS

|                                  | <u>Page</u> |
|----------------------------------|-------------|
| BACKGROUND .....                 | 5.3         |
| Shrimp Beam Trawl Fishery .....  | 5.3         |
| Shrimp Pot Fishery .....         | 5.4         |
| Shrimp Otter Trawl Fishery ..... | 5.6         |
| SEASON SUMMARY .....             | 5.7         |
| Shrimp Beam Trawl Fishery .....  | 5.7         |
| Shrimp Pot Fishery .....         | 5.9         |
| Shrimp Otter Trawl Fishery ..... | 5.10        |
| FUTURE SEASON PROJECTIONS .....  | 5.10        |
| Shrimp Beam Trawl Fishery .....  | 5.10        |
| Shrimp Pot Fishery .....         | 5.13        |
| Shrimp Otter Trawl Fishery ..... | 5.13        |

## LIST OF TABLES

| <u>Table</u>   | <u>Page</u> |
|--|-------------|
| 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp beam trawl catch, number of vessels, number of landings, pounds per vessel, and pounds per landing, 1955 to present ..... | 5.15        |
| 2. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp beam trawl harvest in thousands of pounds by month and season 1969/70 to present .....                                    | 5.16        |
| 3. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp beam trawl harvest (landings) by district and month, 1987/88 .....  | 5.17        |
| 4. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot fishery catch, number of landings and CPUE, 1962 to present .....   | 5.18        |
| 5. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot fishery catch in thousands of pounds by year and month. 1969 to present .....   | 5.19        |
| 6. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot fishery catch in thousands of pounds by year and district 1969 to present .....                                       | 5.20        |
| 7. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot harvest in thousands of pounds (landings) by district and month, 1987 .....   | 5.21        |
| 8. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp otter trawl fishery catch, number of landings and CPUE, 1975/76 to present .....  | 5.22        |
| 9. Historic shrimp otter trawl harvests from District 183, which includes Yakutat Bay .....  | 5.23        |

## BACKGROUND

### Shrimp Beam Trawl Fishery

The beam trawl was the initial shrimp fishing gear when harvesting and processing was initiated in District 10 (Thomas Bay) in 1915. Four additional processors were established by 1921. The fishery continued to expand in fleet size, production capabilities, and geographic fishing area through the 1950's, when the development of the Westward shrimp fisheries started to dominate Alaska shrimp production. The Southeast Alaska beam trawl fishery targets primarily on pink shrimp, (*Pandalus borealis*), with lesser quantities of sidestripe shrimp, (*Pandalopsis dispar*), coonstripe shrimp, (*Pandalus goniurus*), humpy shrimp, (*P. hypsinotus*), and spot prawns, (*P. platycerous*), being landed in the fishery.

From 1955 through 1967, annual beam trawl harvests ranged from 1.7 to 7.6 million pounds and averaged 3.6 million pounds. Number of participating vessels ranged from 10 to 22 during this period, and averaged 16 vessels. The annual harvests prior to 1959 were heavily dependent upon production from District 10. Beam trawl harvests began to decline in the 1960's.

Harvests since 1968/69 have ranged from 0.4 to 2.2 million pounds and averaged 1.2 million pounds. The number of participating vessels ranged from 8 to 23 during the past twenty seasons, and averaged 13 vessels. Effort was relatively low during the early 1970's.

Prior to 1970, two geographic areas produced the major portion of the harvest. These were District 10 (Thomas Bay) and District 6 (Duncan Canal). District 10, which once supported the entire industry, has decreased in documented importance from producing 53 percent of the statistical area harvest in 1960 to less than 1 percent at the current time. Conversely, District 6 contributed 23 percent of the total harvest in 1960, and now



contributes over 70 percent of the total harvest. Production from districts 7 and 8 have become increasingly important to the total harvest since 1960. Districts 6, 8, and 10 have traditionally produced good harvests from May through August. In past years with high production, small shrimp have been evident in the harvests.

During the early years of the fishery there were over 20 active processors. However, this era was characterized by hand-picking the harvest and the annual harvest was relatively low. Production facilities have declined since peak harvests occurred in 1958. In recent years, large harvests have been maintained by up to three facilities, with a total of 2 mechanical picking machines, and some hand-picking of the larger shrimp species. Considering the average harvest of just over 1.18 million pounds since the 1969/70 season, an average of 10 percent sidestripe shrimp, and current prices, this fishery is worth approximately \$430,000 to an average of 13 participating vessels.

Trawling can be conducted only by beam trawl gear in portions of Districts 6, 8, and 10; an open season from May 1 through February 15, unless the district is closed earlier by emergency order based upon the GHR (Guideline Harvest Range); GHRs, reflective of recent historic harvests; and mesh restrictions designed to provide some escapement of smaller shrimp.

#### Shrimp Pot Fishery

The shrimp pot fishery targets on the larger spot prawn. Harvest records indicate that this fishery was at embryonic stages from 1962 to 1968. Until recent years, effort and harvest had been sporadic. Participation in this fishery had been as a supplemental income source for most vessels involved. Product was sold over the dock to private individuals, restaurants, or other markets without passing through the traditional system of processors established for other fish species. In most cases, only "tails" were sold and

ex-vessel prices were quite high dependent upon the size, or count of tails per pound. From 1962 through 1979 annual harvests averaged almost 18,000 pounds of whole shrimp. This level of harvest would be worth approximately \$90,000 annually at current prices. Since 1980 effort and harvest have increased steadily. Many fishermen have entered and utilized the fishery as a major income source. Harvests since 1980 have averaged over 200,000 pounds. Based upon a current average value of \$3.05 per pound of whole shrimp, this average recent harvest has an ex-vessel value of approximately \$610,000 pounds.

Management is limited to collecting fish ticket information and identifying known fishing areas. Very little research has been conducted on the distribution and abundance of spot prawns in Southeast Alaska and Yakutat, especially since the early 1970's. Research during the late 1960's and early 1970's had been accomplished by various agencies to determine the most efficient style of pot utilized in the fishery. Pots studied were primarily of the rectangular variety, with various tunnel configurations. Recent information gleaned from studies British Columbia have identified problems with managing this fishery on a CPUE basis. In Washington, management is currently conducted using a restricted fishing time based upon surveys and provides for the escapement of a portion of the smaller shrimp using mesh restrictions and pot design. In British Columbia, the fishery is managed using mesh restrictions, mandatory logbooks, surveys, and fleet CPUE. British Columbia is considering the implementation of a minimum size limit.

Regulations in the Southeast Alaska shrimp pot fishery include a limit of 150 pots per vessel in Districts 1 through 15, and specifications that pots should be secured with bait removed and doors open if unattended for longer than a two-week period of time. Pot termination devices have been defined for shrimp pots. Open seasons and GHRs have been established for some fishing districts. Due to allocation arguments, the accounting period for the GHRs has oscillated between May (for a primary income summer fishery) to October (for a supplemental income fall fishery). Present open seasons provide for an allocation to the fall fishery. The GHRs were initially

established at the high catch levels for the major fishing districts of 1, 2, 3, and 7. These GHRs have been repealed based upon allocation and stock abundance arguments provided by industry to the Board of Fisheries. A liberal GHR of 75,000 to 100,000 pounds was established for Districts 6 and 8 to allow continued fishing in these districts while maintaining a ceiling to prevent overexploitation. Effective October 1, 1986 a minimum mesh restriction of 1 3/4 inches, stretch measure, went into effect to assist in the escapement of the smaller sized shrimp in the harvest. This minimum mesh restriction has been interpreted in different ways. Enforcement problems currently exist with this regulation with regard to the variety of pot designs utilized in the fishery, the placement of the meshes, and the size of the panel. In Yakutat Bay, the minimum mesh size is 1 1/2 inches in stretch measure.

#### Shrimp Otter Trawl Fishery

The first significant otter trawl landings for shrimp were reported during the 1975/76 season. Locations producing significant harvests included Yakutat Bay, Lituya Bay, Glacier Bay, and Icy Bay. The most significant and consistent fishery occurred in Yakutat Bay. During the 1980/81 season approximately 1.8 million pounds, primarily pink shrimp, were harvested from Yakutat Bay. With the lack of processing facilities in the Yakutat Bay area, shrimp caught in this fishery were landed in Kodiak, Seward, or Washington and Oregon ports. Effort, and subsequently harvests, have been sporadic during recent seasons. Most recent effort has been centered around the Icy Bay area. Statistical Area D harvests since 1980/81 season have averaged 190,000 pounds, which would have an ex-vessel value of approximately \$95,000 based upon current prices.

Regulations pertinent to this fishery include a prohibition against shrimp trawling in Lituya Bay due to the subsistence use of the coonstripe shrimp resource in this area by other user groups; a prohibition against shrimp trawling in Glacier Bay by the National Park Service due to the use of shrimp

as a food source by the humpback whale; prohibitions against otter trawl fishing in the traditional beam trawl areas of Districts 6, 8, and 10; a prohibition against trawling in portions of Yakutat Bay due to the use of that area by shrimp pot fishermen and subsistence users; a Yakutat Bay fishing season of June 21 through February 14 based upon a harvest guideline of 30,000 pounds per month. Stock abundance estimates for pink and side-stripe shrimp in Yakutat Bay have been determined by a series of shrimp research cruises. Point estimates since 1980 have ranged from 1.84 to 6.46 million pounds. Stock abundance research cruises have not been accomplished in Icy Bay. Fishing restrictions for Icy Bay have not been established.

## SEASON SUMMARY

### Shrimp Beam Trawl Fishery

The 1987/88 shrimp beam trawl harvest totaled 1,748,207 pounds through February 14, 1987 when the major fishing grounds closed by regulation. Effort consisted of 23 vessels making 378 landings throughout the fishery. Processing capacity increased through the use of a floating processor and the addition of a second shift in the major processing plant throughout most of the season. Fishing intensity increased this season and resulted in the earliest closure of District 6 in recent history. This contrasts with last season when it was necessary to close District 8 first. When all data from Southeast Alaska are considered, the number of pounds per landing was reduced compared to the 1986/87 season, but was well above historic average. Number of pounds per participating vessel was approximately half of the 1986/87 value and below the historic average. During a portion of the season, vessels were put on industry imposed daily catch limits. When processing facilities had difficulty processing the available product, fishing was voluntarily curtailed for a few days until the plant could catch up.

On July 8, 1987 a news release was issued to close that portion of District 6 north of the latitude and east of the longitude of Point Baker to commercial beam trawling. This area was legally closed by Emergency Order (1-M-14-87) on August 11, 1987. This area encompasses the major fishing grounds in Duncan Canal, Kah Sheets Bay, Level Island, and Alexander Bay. Effort had concentrated on these fishing grounds since the fishery opened May 1, and resulted in a final harvest of 1,230,900 pounds, from 15 vessels making 175 landings. This translates to 7,034 pounds per landing and 82,060 pounds per participating vessel. Both are significantly higher than comparable figures for all fishing areas combined. Data from limited dockside catch sampling indicate that the transition period from males to females (and simultaneous growth in size and weight) occurred from the opening of the fishery through the closure. Data indicated that the recruitment of the smallest size-class of shrimp into the fishery, shrimp from 9.5 to 13.5 mm in carapace length, began in late-May with a peak in mid-June. Data also indicates that three significant size-classes (approximate year-classes) contributed to the fishery this past season. The relative abundance of the smallest-size class (year-class 1+) was low by the end of the season. Results of the limited sampling show that the major portion of the fishery occur during the growth and recruitment period.

After the District 6 closure the available effort, with five additional vessels, began fishing heavily in District 8. This district was closed by Emergency Order (1-M-14-87) on August 11, 1987. At the time of the announced closure, the harvest was approximately 346,000 pounds. By closure time the harvest totaled 431,100 pounds from 176 landings by 20 vessels. These data translate to 2,449 pounds per landing and 21,555 pounds per participating vessel. Dockside samples of landings from District 8 were not collected this past season.

It was not necessary to close District 7 this past season. The total harvest of 69,100 pounds from 21 landings by 5 vessels was near the midpoint of the GHR for this district. The fishery closed by regulation on February 14, 1988.

Two vessels did attempt to fish in District 10. The resulting harvest was low and indicates that rebuilding of these stocks has not occurred.

### Shrimp Pot Fishery

The 1987 shrimp pot fishery harvest totaled 314,578 pounds. Effort consisted of 96 permits fishing and 641 landings. Number of pounds per landing and number of pounds per fished permit were above respective figures for recent years. Markets remained strong through the fishing season.

District 2, with a harvest of 119,900 pounds, contributed the largest proportion of the harvest with approximately 38 percent of the total harvest. District 2, with 70,100 pounds, ranked second with over 22 percent of the total harvest. District 7, with 44,700 pounds was the third most important district. Districts 1, 2, and 7 in combination accounted for 75 percent of the total regional harvest. District 10 with 20,900 pounds landed, and District 13 with 11,700 pounds landed, both contributed significant harvests this past year. While effort was available in other fishing districts, it is not known if the relatively low harvests reported from these other fishing districts are indicative of stock abundance or other factors. Harvests from the Yakutat Bay area continue to be small, comparable to the past four years.

It does appear that additional effort is being expended to develop the fishery in locations other than Districts 1, 2, 3, 7, 6, and 8. However, the removal of the GHR for Districts 1, 2, and 7 will probably result in continued heavy effort in those districts, until either the season is shortened, or a GHR reinstituted.

Effectiveness of the minimum mesh regulation has not been evaluated on a scientific basis since it was implemented on October 1, 1986. Some fishermen that have re-webbed their entire pots have commented that it does effectively retain the larger prawn, but that smaller shrimp can be seen escaping during

the picking process. Fishermen that have utilized a panel of limited size question the effectiveness of the regulation. Until the regulation is sufficiently clear for effective enforcement, it appears that the full intention of the regulation will not be reached. Regulatory wording to correct the present regulation has been drafted.

Information on CPUE management potential utilizing the present data set has been reviewed. Present data is not detailed enough for good estimates of past fishery performance. Changes in the present fish ticket system, the availability of accurate logbooks, adherence to the mesh requirements, adequate enforcement, and a management program explicitly for shrimp would provide more precise management during future seasons. At this time, these resources are not available.

#### Shrimp Otter Trawl Fishery

Effort and resulting harvest from the shrimp otter trawl fishery were both at historic low levels since 1979/80 season. No harvest was reported from the known shrimp population in Yakutat Bay, or from districts in Southeast Alaska. It appears effort and processing capacity have declined. These factors, in addition to the isolated location of the Yakutat grounds, may be partially responsible for the limited harvests.

#### FUTURE SEASON PROJECTIONS

#### Shrimp Beam Trawl Fishery

It is difficult to estimate future season harvests based upon the limited data available. Harvest and limited effort data resulting from fish ticket

data is not an accurate measure of population abundance due to market changes, effort changes, new entrants into the fishery, knowledgeable participants leaving the fishery, gear modifications, etc. Projects to assess the feasibility of estimating shrimp stock abundance using the area-swept method and commercial beam trawls have been developed and submitted. At this time authorization or funding necessary to proceed with this project has not been received. Considering the present fishing and processing effort present in the fishery and the likelihood of increases in both categories, an accurate estimation of population levels will soon be essential to proper fishery management.

During the major portion of the 1987/88 season in District 6, dockside samples of the harvest were collected by the biological staff. This sampling was accomplished on a time available basis. These samples have been taken during the past two years to develop the expertise in measuring and sexing shrimp and to assess the potential of using this tool in the management process. Although this has not been accomplished on a comprehensive basis, this tool has proved very useful in determining the relative strength of different size-classes of the stock, the period of transition from male to female, the time of recruitment into the fishery, and the period of molting and growth. The Department has received and is considering a proposal from private industry to conduct dockside sampling on a regular basis in three major fishing areas. This information would be of great benefit to the management efforts. In addition, the dockside samplers could be utilized to institute an interview/on-board observer program, which would allow the Department to begin a data base on catch per unit of effort (CPUE). The combination of population estimates, information on the size-class composition of the stock, and information on CPUE levels would allow future management to occur on a much more rational basis.

It is possible that the strong presence of three size-classes in the fishery during the 1987/88 season will result in a similar stock composition during the 1988/89 season unless overwinter survival is poor. Either the 1988 year-class experienced poor survival from egg-hatch to male or overexploitation



occurred last season. It is also possible that the higher than average harvests and harvest rates indicate a general healthy shrimp stock for the near future. However, it should be noted that results of the limited dockside sampling information indicated that the smallest size-class of shrimp were not present in late season harvests from District 6. This could be due to a number of factors such as areas fished, life history changes, etc. The lack of small shrimp in later harvests could also be a result of fishing. If fishing had a significant negative effect on the smallest size-class, then stock problems may be present. Without definitive information and data, it is not possible to determine future stock condition with any degree of accuracy.

The GHR's utilized in the shrimp beam trawl fishery were determined from historic harvests that occurred without restrictive management. These GHR's were established in 1978 from harvest data compiled by fishing district from the 1970's. These data generally indicate a low level of effort using the number of participating vessels as criteria.

It could be assumed that the resulting harvest from low levels of effort are also low with respect to the shrimp population abundance, and the GHR's are conservative. It is possible that recent harvests have been conservative and similar harvests could be expected during the 1988/89 season. Once again, it is not possible to reach that conclusion on a scientific basis.

Issues likely to surface at the next consideration of shrimp proposals could include: increase in minimum mesh size for beam trawls during the pink shrimp fishery; establish a large minimum mesh size for a winter sidestripe fishery; establish a separate GHR for a winter sidestripe fishery; increase the GHR's for the pink shrimp fishery; and establish split seasons for the beam trawl fishery with distinct GHRs.

## Shrimp Pot Fishery

It is extremely difficult to provide a reasonable prediction on future harvests and stock conditions with the paucity of information available. Considering that current regulations will continue and that the market remains strong for spot prawns, it is likely that the 1988 harvest will be similar in distribution and magnitude to that experienced in 1987. Sufficient effort is available to increase the harvest if effort intensifies in known areas and effort disperses to lightly fished areas. I would expect that the harvest will be slightly elevated above that experienced in 1987 and that the increased harvest will come from additional fishing effort on the known stocks.

The management program will continue to be limited to the collection of fish ticket information. Time may be available to evaluate the size-class distribution of the harvest, as reported on fish tickets, in an attempt to evaluate the effectiveness of the mesh regulations.

Due to the continued controversy with pot shrimp management, mesh regulations, and allocation between summer and fall fishing, it is possible that a considerable number of proposals will be presented to the Alaska Board of Fisheries at the next shellfish meeting.

## Shrimp Otter Trawl Fishery

Management is limited to collection of information through the fish ticket system. Research surveys to estimate the population level in Yakutat Bay have not been conducted since fall of 1984 no have research cruises been conducted in Icy Bay. Present information makes predicting future harvests on a scientific basis fruitless.

Effort and the resulting harvest will probably continue to be limited in the shrimp otter trawl fishery. In recent years, available effort has opted to concentrate on the Icy Bay area possibly as a result of the restrictive 30,000 pounds per month from Yakutat Bay.

Table 1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp beam trawl catch, number of vessels, number of landings, pounds per vessel, and pounds per landing, 1955 to present.

| Year/<br>Season      | Catch<br>in Pounds | Number of<br>Vessels | Landings | Pounds<br>per<br>Vessel | Pounds<br>per<br>Landing |
|----------------------|--------------------|----------------------|----------|-------------------------|--------------------------|
| 1955                 | 1,777,122          | 15                   |          | 118,475                 |                          |
| 1956                 | 3,301,598          | 15                   |          | 220,107                 |                          |
| 1957                 | 2,350,449          | 10                   |          | 235,045                 |                          |
| 1958                 | 7,605,871          | 14                   |          | 543,277                 |                          |
| 1959                 | 5,518,843          | 22                   |          | 250,857                 |                          |
| 1960                 | 3,343,373          | 21                   | 1,007    | 159,208                 | 3,320                    |
| 1961                 | 4,212,300          | 20                   | 1,394    | 210,615                 | 3,022                    |
| 1962                 | 3,884,050          | 22                   | 1,400    | 176,548                 | 2,774                    |
| 1963                 | 3,110,340          | 20                   | 1,080    | 155,517                 | 2,880                    |
| 1964                 | 2,793,101          | 13                   | 1,092    | 214,854                 | 2,558                    |
| 1965                 | 2,941,429          | 13                   | 1,338    | 226,264                 | 2,198                    |
| 1966                 | 3,784,597          | 14                   | 1,663    | 270,328                 | 2,276                    |
| 1967                 | 2,203,753          | 13                   | 1,105    | 169,519                 | 1,994                    |
| 1968/69              | 2,003,753          | 12                   | 925      | 166,979                 | 2,166                    |
| 1969/70              | 1,840,727          | 10                   | 952      | 184,073                 | 1,934                    |
| 1970/71              | 742,404            | 8                    | 477      | 92,801                  | 1,556                    |
| 1971/72              | 1,050,978          | 8                    | 592      | 131,372                 | 1,775                    |
| 1972/73              | 797,387            | 9                    | 421      | 88,599                  | 1,894                    |
| 1973/74              | 674,386            | 8                    | 460      | 84,298                  | 1,466                    |
| 1974/75              | 1,205,617          | 9                    | 434      | 133,957                 | 2,778                    |
| 1975/76              | 983,609            | 12                   | 450      | 81,967                  | 2,186                    |
| 1976/77              | 768,930            | 14                   | 476      | 54,924                  | 1,615                    |
| 1977/78              | 949,043            | 10                   | 404      | 94,904                  | 2,349                    |
| 1978/79              | 1,033,325          | 9                    | 519      | 114,814                 | 1,991                    |
| 1979/80              | 956,927            | 17                   | 979      | 56,290                  | 977                      |
| 1980/81              | 843,737            | 21                   | 917      | 40,178                  | 920                      |
| 1981/82              | 918,975            | 14                   | 523      | 65,641                  | 1,757                    |
| 1982/83              | 1,397,026          | 15                   | 454      | 93,135                  | 3,077                    |
| 1983/84              | 1,768,148          | 17                   | 668      | 104,009                 | 2,647                    |
| 1984/85              | 1,289,970          | 21                   | 809      | 61,427                  | 1,595                    |
| 1985/86              | 428,184            | 16                   | 249      | 26,762                  | 1,720                    |
| 1986/87              | 2,202,119          | 15                   | 426      | 146,808                 | 5,169                    |
| 1987/88 <sup>1</sup> | 1,748,207          | 23                   | 378      | 76,009                  | 4,625                    |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 2. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp beam trawl harvest in thousands of pounds, by month and season 1969/70 to present.

| Season               | May   | June  | July  | Aug   | Sept  | Oct   | Nov   | Dec   | Jan   | Feb   | Mar  | Apr  | Total   |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|---------|
| 1969/70              | 326.7 | 280.2 | 78.8  | 129.1 | 184.7 | 241.2 | 119.6 | 165.2 | 160.0 | 100.6 | 32.4 | 22.4 | 1,840.7 |
| 1970/71              | 131.3 | 105.1 | 65.5  | 79.8  | 49.7  | 64.3  | 54.8  | 59.2  | 59.9  | 56.8  | 2.8  | 13.2 | 742.4   |
| 1971/72              | 139.0 | 106.3 | 144.5 | 106.5 | 69.7  | 78.3  | 101.6 | 71.1  | 66.0  | 121.1 | 38.7 | 8.2  | 1,051.1 |
| 1972/73              | 168.5 | 126.4 | 77.2  | 66.1  | 65.8  | 44.7  | 64.0  | 46.3  | 81.6  | 42.2  | 6.1  | 8.5  | 797.4   |
| 1973/74              | 96.3  | 124.1 | 72.6  | 73.7  | 45.0  | 32.0  | 59.1  | 64.8  | 60.3  | 29.2  | 8.8  | 8.5  | 674.4   |
| 1974/75              | 160.9 | 199.2 | 202.4 | 168.0 | 120.1 | 61.4  | 73.9  | 90.8  | 104.2 | 21.6  | 0.7  | 2.4  | 1,205.6 |
| 1975/76              | 180.7 | 130.3 | 67.2  | 92.6  | 112.3 | 154.5 | 73.0  | 77.8  | 38.9  | 46.1  | 3.6  | 6.6  | 983.6   |
| 1976/77              | 78.8  | 171.7 | 120.0 | 118.8 | 61.8  | 37.4  | 55.2  | 33.3  | 65.0  | 25.7  | 0.5  | 0.8  | 768.9   |
| 1977/78              | 73.7  | 235.3 | 147.9 | 166.6 | 126.2 | 48.3  | 29.5  | 18.7  | 81.2  | 21.7  | 0.0  | 0.0  | 949.1   |
| 1978/79              | 107.0 | 130.9 | 140.6 | 240.2 | 112.0 | 93.1  | 67.8  | 36.0  | 72.3  | 22.5  | 8.3  | 2.5  | 1,033.3 |
| 1979/80              | 98.2  | 154.9 | 146.6 | 177.4 | 104.3 | 55.1  | 58.4  | 39.6  | 65.9  | 48.2  | 3.5  | 4.4  | 956.9   |
| 1980/81              | 153.8 | 168.6 | 165.0 | 153.8 | 54.2  | 30.2  | 35.5  | 12.2  | 33.6  | 31.6  | 1.8  | 3.7  | 843.7   |
| 1981/82              | 165.1 | 183.4 | 124.0 | 168.8 | 81.1  | 52.8  | 36.2  | 48.3  | 33.1  | 22.3  | 0.9  | 3.1  | 919.0   |
| 1982/83              | 181.1 | 171.7 | 168.8 | 159.4 | 134.0 | 50.1  | 60.7  | 82.0  | 152.6 | 119.8 | 64.4 | 52.5 | 1,397.1 |
| 1983/84              | 436.3 | 249.0 | 287.0 | 218.3 | 138.5 | 132.0 | 83.3  | 86.9  | 100.3 | 16.2  | 9.0  | 9.6  | 1,768.1 |
| 1984/85              | 156.3 | 252.5 | 269.9 | 232.8 | 130.9 | 59.5  | 61.8  | 49.7  | 51.9  | 22.5  | 1.1  | 1.0  | 1,289.9 |
| 1985/86              | 125.4 | 105.3 | 46.1  | 23.2  | 39.1  | 13.8  | 31.3  | 27.8  | 8.6   | 7.7   | 0.8  | 0.0  | 428.2   |
| 1986/87              | 294.0 | 507.8 | 576.0 | 446.8 | 372.0 | 0.7   | 0.0   | 1.9   | 0.5   | 0.4   | 0.3  | 1.2  | 2,202.1 |
| 1987/88 <sup>1</sup> | 633.0 | 721.0 | 291.0 | 90.8  | 0.1   | 0.1   | 1.3   | 7.5   | 0.0   | 3.4   | --   | --   | 1,748.2 |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 3. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp beam trawl harvest (landings) by district and month, 1987/88.

| Month                     | District   |           |            |    |    |     | Total<br>Vessels | Total<br>Catch |
|---------------------------|------------|-----------|------------|----|----|-----|------------------|----------------|
|                           | 6          | 7         | 8          | 10 | 11 | 186 |                  |                |
| May                       | 465.7 (69) | 55.3 ( 9) | 112.0 (58) | *  |    |     | 18               | 633.0          |
| June                      | 647.9 (84) |           | 70.9 (24)  |    |    | *   | 14               | 718.8          |
| July                      | 117.3 (22) |           | 173.7 (67) |    |    |     | 10               | 291.0          |
| August                    |            | *         | 74.5 (27)  | *  | *  |     | 6                | 74.5           |
| Sept                      |            | *         |            |    |    |     | *                | *              |
| Oct                       |            | *         |            |    |    |     | *                | *              |
| Nov                       |            | *         |            |    |    |     | *                | *              |
| Dec                       |            | *         |            |    |    |     | *                | *              |
| Jan                       |            |           |            |    |    |     |                  |                |
| Feb                       |            | *         |            |    |    |     | *                | *              |
| Total<br>Harvest          | 1,230.9    | 69.1      | 431.1      | *  | *  | *   |                  | 1,748.2        |
| Landings                  | 175        | 9         | 176        | *  | *  | *   |                  | 360            |
| No. Vessels<br>in Fishery | 15         | 5         | 20         | *  | *  | *   |                  | 23             |

\* Where number of vessels participating is three or less, information is confidential.

Table 4. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot fishery catch, number of landings and CPUE, 1962 to present.

| Year              | Catch in Pounds | Number of Permits Fished | Number of Landings | Pounds Per Landing | Pounds Per Vessel |
|-------------------|-----------------|--------------------------|--------------------|--------------------|-------------------|
| 1962              | 488             |                          | 6                  | 81                 |                   |
| 1963              | 686             |                          | 9                  | 76                 |                   |
| 1964              | 3,669           |                          | 11                 | 334                |                   |
| 1965              | 0               |                          | 0                  |                    |                   |
| 1966              | *               |                          | *                  | *                  |                   |
| 1967              | 38,900          |                          | 113                | 344                |                   |
| 1968              | 38,209          |                          | 65                 | 588                |                   |
| 1969              | 40,196          | 5                        | 53                 | 758                | 8,039             |
| 1970              | 32,833          | 5                        | 42                 | 782                | 6,567             |
| 1971              | 10,122          | 4                        | 24                 | 422                | 2,531             |
| 1972              | 26,963          | 7                        | 44                 | 613                | 3,852             |
| 1973              | *               | *                        | *                  | *                  | *                 |
| 1974              | 15,954          | 5                        | 18                 | 886                | 3,191             |
| 1975              | 5,841           | 5                        | 11                 | 531                | 1,168             |
| 1976              | 12,451          | 6                        | 31                 | 402                | 2,075             |
| 1977              | 19,185          | 7                        | 17                 | 1,129              | 2,741             |
| 1978              | 28,202          | 9                        | 82                 | 344                | 3,134             |
| 1979              | 23,305          | 10                       | 30                 | 777                | 2,331             |
| 1980              | 63,095          | 26                       | 146                | 432                | 2,427             |
| 1981              | 86,803          | 34                       | 227                | 382                | 2,553             |
| 1982              | 174,593         | 52                       | 428                | 408                | 3,358             |
| 1983              | 289,964         | 87                       | 549                | 528                | 3,333             |
| 1984              | 255,825         | 118                      | 738                | 347                | 2,168             |
| 1985              | 254,858         | 106                      | 749                | 340                | 2,404             |
| 1986              | 252,670         | 93                       | 602                | 420                | 2,717             |
| 1987 <sup>1</sup> | 314,578         | 96                       | 641                | 491                | 3,277             |

<sup>1</sup> Most recent year's data should be considered preliminary.

\* Where number of vessels participating is three or less, information is confidential.

Table 5. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot fishery catch in thousands of pounds by year and month, 1969 to present.

| Year              | Month  |        |        |        |        |        |        |        |        |        |        |        | Total   | Landings | Permits |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|----------|---------|
|                   | Jan    | Feb    | Mar    | Apr    | May    | Jun    | Jul    | Aug    | Sept   | Oct    | Nov    | Dec    |         |          |         |
| 1969              | 4,246  | 5,669  | 13,475 | 5,471  | 6,473  | 3,410  | 0      | 0      | 0      | 0      | 0      | 1,452  | 40,196  | 53       | 5       |
| 1970              | 4,594  | 4,638  | 5,094  | 2,470  | 4,303  | 6,481  | 976    | 0      | 0      | 282    | 782    | 3,213  | 32,833  | 42       | 5       |
| 1971              | 1,649  | 3,520  | 1,268  | 0      | 0      | 0      | 0      | 0      | 1,970  | 231    | 938    | 546    | 10,122  | 24       | 4       |
| 1972              | 1,846  | 1,588  | 4,301  | 10,923 | 3,788  | 1,750  | 0      | 2,142  | 0      | 625    | 0      | 0      | 26,963  | 44       | 7       |
| 1973              | *      | *      | *      | *      | *      | *      | *      | *      | *      | *      | *      | *      | *       | *        | *       |
| 1974              | 0      | 1,350  | 4,456  | 7,274  | 0      | 1,665  | 0      | 0      | 0      | 362    | 280    | 567    | 15,954  | 18       | 5       |
| 1975              | 70     | 567    | 1,265  | 675    | 0      | 0      | 956    | 0      | 0      | 0      | 362    | 1,946  | 5,841   | 11       | 5       |
| 1976              | 580    | 1,078  | 1,617  | 1,484  | 1,463  | 1,279  | 1,597  | 1,167  | 0      | 0      | 540    | 1,646  | 12,451  | 31       | 6       |
| 1977              | 10,400 | 0      | 1,454  | 6,466  | 0      | 0      | 310    | 0      | 100    | 369    | 86     | 0      | 19,185  | 17       | 7       |
| 1978              | 9,943  | 1,351  | 1,633  | 5,250  | 3,890  | 255    | 690    | 90     | 2      | 560    | 11     | 4,527  | 28,202  | 82       | 9       |
| 1979              | 0      | 0      | 0      | 3,239  | 5,109  | 3,168  | 3,946  | 1,644  | 3,589  | 1,790  | 820    | 0      | 23,305  | 30       | 10      |
| 1980              | 799    | 1,544  | 3,728  | 2,479  | 12,388 | 8,421  | 7,840  | 1,519  | 11,112 | 9,410  | 3,149  | 706    | 63,095  | 146      | 26      |
| 1981              | 1,679  | 1,373  | 4,041  | 7,443  | 8,275  | 7,171  | 22,552 | 9,964  | 5,717  | 11,413 | 2,863  | 4,312  | 86,803  | 227      | 34      |
| 1982              | 2,625  | 5,113  | 9,907  | 9,955  | 3,288  | 4,982  | 32,589 | 47,300 | 15,039 | 20,566 | 7,042  | 16,187 | 174,593 | 428      | 52      |
| 1983              | 9,214  | 25,817 | 7,468  | 990    | 4,501  | 3,281  | 50,712 | 42,895 | 58,223 | 38,234 | 34,208 | 14,421 | 289,964 | 549      | 87      |
| 1984              | 12,224 | 20,290 | 22,311 | 24,382 | 30,596 | 29,437 | 8,804  | 8,038  | 4,305  | 32,313 | 36,604 | 26,521 | 255,825 | 738      | 118     |
| 1985              | 29,795 | 35,681 | 9,076  | 8,467  | 29,125 | 19,873 | 15,909 | 17,608 | 18,964 | 15,191 | 26,696 | 28,473 | 254,858 | 749      | 106     |
| 1986              | 28,932 | 30,459 | 27,101 | 10,088 | 2,416  | 3,386  | 8,084  | 7,783  | 3,389  | 45,647 | 45,443 | 39,942 | 252,670 | 602      | 93      |
| 1987 <sup>1</sup> | 45,660 | 61,393 | 24,912 | 7,546  | 5,349  | 2,392  | 5,591  | 3,639  | 4,930  | 64,088 | 47,576 | 41,502 | 314,578 | 641      | 96      |

\* Where number of vessels participating is three or less, information is confidential.

<sup>1</sup> Most recent year's data should be considered preliminary.



Table 6. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot fishery catch in thousands of pounds by year and district 1969 to present.

| Dist     | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982  | 1983  | 1984  | 1985  | 1986  | 1987 <sup>1</sup> |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------------------|
| 1        | 32.9 | 11.0 | 3.9  | 8.4  | *    | 3.0  | 1.6  | 4.4  | 3.6  | 5.7  | 4.2  | 21.4 | 14.5 | 18.9  | 39.5  | 47.4  | 58.5  | 47.6  | 70.1              |
| 2        | 4.5  | 1.5  | 3.3  | 14.8 | *    | 12.8 | 4.0  | 6.7  | 10.8 | 13.1 | 7.3  | 13.2 | 16.5 | 18.1  | 32.5  | 19.0  | 50.6  | 68.0  | 119.9             |
| 3        |      | 8.1  |      |      | *    |      | 0.2  | 1.4  |      |      | 4.2  | 7.6  | 23.1 | 60.5  | 61.0  | 35.5  | 31.0  | 65.5  | 26.0              |
| 4        |      |      |      |      | *    |      |      |      |      |      | 1.3  | 0.4  |      |       | 1.0   |       |       | 0.7   | 0.1               |
| 5        |      |      |      |      | *    |      |      |      |      | 0.7  |      |      |      |       | 0.9   |       | 0.2   | 0.1   | 0.9               |
| 6        |      |      |      |      | *    |      |      |      |      |      |      |      | 4.5  | 4.5   | 13.6  | 4.7   | 4.4   | 5.7   | 1.2               |
| 7        | 2.8  |      |      | 1.7  | *    |      |      |      | 4.8  | 3.8  | 5.0  | 15.4 | 19.2 | 28.2  | 73.1  | 82.7  | 57.6  | 26.3  | 44.7              |
| 8        |      | 1.1  | 0.9  |      | *    |      |      |      |      | 4.5  |      | 0.8  |      | 2.2   | 4.9   | 15.0  | 5.5   | 3.4   | 1.6               |
| 9        |      |      |      | 0.2  | *    |      |      |      |      |      |      | 2.7  | 2.1  | 4.1   | 6.0   | 1.0   | 1.9   | 0.6   | 6.2               |
| 10       |      | 0.2  | 2.0  | 1.9  | *    |      |      |      |      |      |      |      | 2.1  | 0.0   | 5.5   | 13.3  | 26.5  | 15.5  | 20.9              |
| 11       |      |      |      |      | *    |      |      |      |      |      |      |      | 0.1  | 0.5   |       | 0.2   | 1.3   | 0.5   | 1.2               |
| 12       |      |      |      |      | *    |      |      |      |      |      | 1.3  | 0.0  | 2.0  | 1.1   | 0.5   | 3.7   | 1.6   | 2.3   | 5.6               |
| 13       |      |      |      |      | *    |      |      |      |      | 0.4  | 0.1  | 0.5  | 0.5  | 15.8  | 15.2  | 21.1  | 9.0   | 6.5   | 11.7              |
| 14       |      |      |      |      | *    |      |      |      |      |      |      | 1.0  | 1.4  | 0.2   | 0.1   | 0.1   | 0.4   | 0.1   | 0.1               |
| 15       |      |      |      |      | *    |      |      |      |      |      |      |      |      |       |       |       | 0.2   | 0.3   | 0.8               |
| 16       |      |      |      |      | *    |      |      |      |      |      |      |      |      | 20.5  |       | 4.0   | 3.6   | 2.8   | 0.8               |
| 183      |      | 10.1 |      |      | *    | 0.1  |      |      |      |      |      | 0.1  | 0.6  | 0.0   | 36.3  | 6.5   | 2.3   | 6.7   | 2.6               |
| 186      |      |      |      |      | *    |      |      |      |      |      |      |      |      |       |       | 1.6   |       |       |                   |
| Total    | 40.2 | 32.8 | 10.1 | 27.0 | *    | 16.0 | 5.8  | 12.5 | 19.2 | 28.2 | 23.3 | 63.1 | 86.8 | 174.6 | 290.0 | 255.8 | 254.9 | 252.7 | 314.6             |
| Landings | 53   | 42   | 24   | 44   | *    | 18   | 11   | 31   | 17   | 82   | 30   | 146  | 227  | 428   | 549   | 738   | 749   | 602   | 641               |
| Vessels  | 5    | 5    | 4    | 7    | *    | 5    | 5    | 6    | 7    | 9    | 10   | 26   | 34   | 52    | 87    | 118   | 106   | 93    | 96                |

<sup>1</sup> Most recent year's data should be considered preliminary.

\* Where number of vessels participating is three or less, information is confidential.

NOTE: Number of vessels reported as actual number of vessels fishing in 1969 through 1974 season, and number of permits fished from 1974 to the present.

Table 7. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp pot harvest in thousands of pounds (landings) by district and month, 1987.

| Month | District      |                |             |          |            |             |               |             |             |              |          |          |              |          |             |          |             |                | Total |
|-------|---------------|----------------|-------------|----------|------------|-------------|---------------|-------------|-------------|--------------|----------|----------|--------------|----------|-------------|----------|-------------|----------------|-------|
|       | 1             | 2              | 3           | 4        | 5          | 6           | 7             | 8           | 9           | 10           | 11       | 12       | 13           | 14       | 15          | 16       | 183         |                |       |
| Jan   | 5.8<br>(10)   | 23.5<br>(23)   | *<br>(*)    |          |            | *<br>(*)    | 9<br>(24)     | *<br>(*)    |             | *<br>(*)     | *<br>(*) |          | *<br>(*)     |          | *<br>(*)    |          | *<br>(*)    | 38.3           |       |
| Feb   | 9.5<br>(16)   | 45.7<br>(30)   | 9.2<br>(6)  |          |            | *<br>(*)    | 11.1<br>(32)  |             |             | 1.2<br>(5)   |          |          | 0.9<br>(5)   |          | 0.1<br>(9)  |          | *<br>(*)    | 77.7           |       |
| Mar   |               |                |             |          | 0.9<br>(4) |             |               |             | *           | 3.6<br>(10)  |          | *        | 1.1<br>(6)   |          |             |          |             | 5.6            |       |
| Apr   |               |                |             |          |            |             |               |             |             | 5.3<br>(12)  | *        |          | 2.1<br>(9)   |          | *           |          |             | 7.4            |       |
| May   |               |                |             |          |            | *           |               | 0.7<br>(4)  |             | 2.7<br>(11)  | *        |          | *            |          | 0.4<br>(4)  |          | *<br>(*)    | 3.8            |       |
| Jun   |               |                |             |          |            | *           |               | *           |             | *            | *        | *        | *            |          | *           | *        |             | 0              |       |
| Jul   |               |                |             |          |            | 0.4<br>(4)  |               | *           | *           | 4.3<br>(12)  |          | *        | *            |          |             | *        | *           | 4.7            |       |
| Aug   |               |                |             |          |            | *           |               | *           | *           | 0.7<br>(8)   |          | *        | 0.6<br>(5)   | *        |             | *        | *           | 1.3            |       |
| Sep   |               |                |             |          |            | *           |               |             | 1.5<br>(4)  | 1.5<br>(8)   |          | *        | 1.1<br>(7)   |          |             |          |             | 4.1            |       |
| Oct   | 16.4<br>(32)  | 36.6<br>(35)   |             |          |            | *           | 8.5<br>(14)   | *           |             | 0<br>(4)     |          | *        | 1.6<br>(7)   |          |             |          |             | 63.1           |       |
| Nov   | 21.9<br>(38)  | 8.2<br>(24)    |             |          |            | *           | 10.6<br>(26)  | 0.2<br>(4)  | *           | 1<br>(4)     |          | *        | 0.8<br>(4)   |          |             |          | *<br>(*)    | 42.7           |       |
| Dec   | 16.5<br>(36)  | 5.9<br>(15)    | *<br>(*)    | *<br>(*) |            |             | 5.5<br>(24)   | *<br>(*)    | 0.3<br>(5)  | *<br>(*)     |          |          | 2.2<br>(7)   |          |             |          | 0.3<br>(5)  | 30.7           |       |
| Total | 70.1<br>(132) | 119.9<br>(127) | 9.2<br>(12) | *<br>(*) | 0.9<br>(4) | 0.4<br>(17) | 44.7<br>(121) | 0.9<br>(16) | 1.8<br>(17) | 20.3<br>(80) | *<br>(*) | *<br>(*) | 10.4<br>(61) | *<br>(*) | 0.5<br>(20) | *<br>(*) | 0.3<br>(16) | 314.6<br>(641) |       |

\* Where number of vessels participating is three or less, information is confidential.

Table 8. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) shrimp otter trawl fishery catch, number of landings and CPUE, 1975/76 to present.

| Year/<br>Season      | Catch<br>in<br>Pounds | Number<br>of<br>Landings | Pounds<br>Per<br>Landing | Number<br>of<br>Vessels | Pounds<br>Per<br>Vessel |
|----------------------|-----------------------|--------------------------|--------------------------|-------------------------|-------------------------|
| 1975/76              | *                     | *                        | *                        | *                       | *                       |
| 1976/77              | 150,800               | 4                        | 37,700                   | *                       | *                       |
| 1977/78              | 0                     | 0                        |                          | 0                       | 0                       |
| 1978/79              | 0                     | 0                        |                          | 0                       | 0                       |
| 1979/80              | 66,220                | 8                        | 8,278                    | *                       | *                       |
| 1980/81 <sup>1</sup> | 2,051,966             | 38                       | 53,999                   | 19                      | 107,998                 |
| 1981/82              | 36,365                | 4                        | 9,091                    | *                       | *                       |
| 1982/83              | 138,246               | 8                        | 17,281                   | *                       | *                       |
| 1983/84              | 417,362               | 11                       | 37,942                   | 6                       | 69,560                  |
| 1984/85              | 202,259               | 6                        | 33,710                   | 4                       | 50,565                  |
| 1985/86              | *                     | *                        | *                        | *                       | *                       |
| 1986/87              | 480,374               | 11                       | 43,670                   | 4                       | 120,094                 |
| 1987/88 <sup>2</sup> | 10,448                | 5                        | 2,090                    | *                       | *                       |

<sup>1</sup> 1980/81 season includes a catch of 450,000 pounds reported out of Yakutat Bay in August and September but not reported via fish tickets.

<sup>2</sup> Most recent year's data should be considered preliminary.

Table 9. Historic shrimp otter trawl harvests from District 183, which includes Yakutat Bay.

| Year/<br>Season      | Harvest In<br>Round Pounds | Number<br>of Landings | Pounds Per<br>Landing |
|----------------------|----------------------------|-----------------------|-----------------------|
| 1979/80              | *                          | *                     | *                     |
| 1980/81 <sup>1</sup> | 1,799,899                  | 21                    | 85,709                |
| 1981/82              | *                          | *                     | *                     |
| 1982/83              | *                          | *                     | *                     |
| 1983/84              | *                          | *                     | *                     |
| 1984/85              | *                          | *                     | *                     |
| 1985/86              | 0                          |                       |                       |
| 1986/87              | 0                          |                       |                       |
| 1987/88 <sup>2</sup> | 0                          |                       |                       |

<sup>1</sup> 1980/1981 season includes 450,000 pounds reported checking out of Yakutat Bay during the fishery (August 1980) but not reported via fish tickets.

<sup>2</sup> Most recent year's data should be considered preliminary.

REPORT TO THE BOARD OF FISHERIES  
SOUTHEAST ALASKA (STATISTICAL AREA A)  
AND  
YAKUTAT (STATISITCAL AREA D)  
KING CRAB  
1987 / 1988

By  
Timothy Koeneman

Southeast Region  
Alaska Department of Fish and Game  
Division of Commercial Fisheries

April 1988

## TABLE OF CONTENTS

|                                   | <u>Page</u> |
|-----------------------------------|-------------|
| BACKGROUND .....                  | 6.3         |
| Abalone .....                     | 6.3         |
| Scallops .....                    | 6.4         |
| Geoduck .....                     | 6.5         |
| Sea Urchins .....                 | 6.6         |
| Sea Cucumbers .....               | 6.7         |
| Octopus .....                     | 6.7         |
| Squid .....                       | 6.8         |
| SEASON SUMMARY .....              | 6.8         |
| Abalone .....                     | 6.8         |
| Scallops .....                    | 6.9         |
| Geoduck .....                     | 6.9         |
| Sea Urchins .....                 | 6.10        |
| Sea Cucumbers .....               | 6.12        |
| Octopus .....                     | 6.13        |
| Squid .....                       | 6.13        |
| FUTURE SEASONAL PROJECTIONS ..... | 6.13        |
| Abalone .....                     | 6.13        |
| Scallops .....                    | 6.14        |
| Geoduck .....                     | 6.14        |
| Sea Urchins .....                 | 6.15        |
| Sea Cucumbers .....               | 6.15        |
| Octopus .....                     | 6.16        |
| Squid .....                       | 6.16        |

## LIST OF TABLES

| <u>Table</u>   | <u>Page</u> |
|--|-------------|
| 1. Statistical Area A (Southeast Alaska) historic abalone, harvests in pounds by management area, 1964 to present .....                                      | 6.17        |
| 2. Statistical Area A (Southeast Alaska) abalone, seasonal commercial harvests in round pounds (landings) by district, 1977/78 to present .....              | 6.18        |
| 3. Statistical Area A (Southeast Alaska) 1986/87 and 1987/88 seasons harvest statistics of pinto abalone, in pounds and landings by district and month ..... | 6.19        |
| 4. Statistical Area A (Southeast Alaska) historic abalone fishery statistics .....   | 6.20        |
| 5. Statistical Area A (Southeast Alaska) abalone, summary of commercial dockside sampling data .....   | 6.21        |
| 6. Comparative length frequencies from research sites in Districts 3 and 4 (outside Prince of Wales Island) in areas open to commercial exploitation .....   | 6.22        |
| 7. Statistical Area D (Yakutat) historic commercial catch and effort of weathervane scallops .....   | 6.23        |
| 8. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) commercial catch (landings) of miscellaneous species .....                         | 6.24        |

## BACKGROUND

### Abalone

The Alaskan abalone fishery targets the pinto or northern abalone, (*Haliotis kamschatkana*), which inhabits the rocky, lower intertidal and subtidal surge zones of the outer coasts of Southeast Alaska. Commercially harvestable quantities of abalone occur in parts of Districts 3, 4, and 13. Life history information for this species in Alaska is very limited. Tagging studies indicate it is a slow growing, long-lived species. Spawning probably occurs during the summer through the early autumn in the most productive areas. Size frequency information indicates that, in at least some areas, a climax population may have existed prior to recent commercial exploitation. Recruitment levels appear to be low and sporadic. Fecundity increases greatly with increasing shell length. Known predators include rockfish, starfish, octopus, sea otter, and man. Throughout the range of various abalone species, exploitation has resulted in stock depletion.

Abalone can be picked by hand from the shoreline during extreme low tides. However, the commercial fishery utilizes SCUBA or Hooka gear and most of the harvest occurs subtidally. Fishing success is variable depending upon weather, substrate, vegetative growth, visibility, diver experience, abalone abundance, and other factors.

From 1964 through 1976, harvest of Alaskan abalone were highly variable. In 1977, a reduced supply of abalone products on the world market, the acceptance of the pinto abalone in the Japanese market, favorable monetary exchange rates for the yen, and relaxed Alaskan harvest regulations improved the commercial feasibility of this fishery. Effort increased in 1977 and resulted in high harvests. The peak seasons for the fishery were between 1978/79 and 1980/81, during each of which over 260,000 pounds were harvested. Seasonal landings since 1977/78 have averaged 148,020 pounds, although the



annual harvest has been restricted to about one-third that in recent years by more conservative management. Number of participating vessels or operators has exceeded 40 in some years. The estimated average ex-vessel value was approximately \$0.5 million until recent seasons.

Management strategies established in the commercial fishery include a closed season during sensitive life history stages of spawning and settling, a minimum legal size to insure some degree of reproduction prior to recruitment into the fishery, closed waters to insure that some stocks are not subject to commercial exploitation, and guideline harvest ranges intended to protect the two major fisheries from commercial overexploitation. The management objective is to provide for commercial harvests with an established guideline harvest level of 8,000 pounds for District 13, and a range of 25,000 to 50,000 pounds for all other districts combined. The fishing season starts by regulation on October 1.

### Scallops

The weathervane scallop, (*Pactinopectin caurinus*), is commercially harvested from offshore, productive beds in Statistical Area D (Yakutat) by vessels using scallop dredges. Studies conducted during the developmental stages of this fishery indicated an average size of maturity for this species of approximately three inches in shell length. Consequently, the management strategy employed in this fishery is to limit ring diameters in scallop dredges to four inches, theoretically large enough for escapement of some mature scallops to insure continuity of the species. In addition, a permit registration system provides information on effort levels and the fish ticket system reports the harvest in terms of pounds of shucked meats.

The early years of the fishery, 1968 and 1969, were very productive. They were followed by a few years of relatively low effort and harvest. The fishery expanded again during the mid-1970's, followed again by low effort

and harvest during the late 1970's. Effort and harvest increased once again from 1980 through 1982, decreased in 1983, increased in 1984, decreased in 1985, and increased through 1987. Some of these fluctuations in effort and harvest may have been a result of market conditions and the presence of more lucrative alternative fishing opportunities. However, a trend of high harvests followed by a subsequent decline, and then subsequent high harvests is suggested in the data and may be an indication of the need for a recovery period after periods of high harvest. An additional factor which confounds analysis of the harvest data is participation in most years by very few vessels. In such cases the harvest is driven largely by the relative effort expended by the participants in a given year. The catch for the last five years has averaged about 49,281 pounds of shucked meats. Current ex-vessel price per pound is approximately \$3.50.

#### Geoduck

Known geoduck clam, (*Panope generosa*), beds occur sporadically in the central and southern portion of Southeast Alaska, primarily near the outside coast. Studies done in other locations, specifically Puget Sound, indicate that this clam may live to be in excess of 100 years old. It appears that Southeast Alaska is the extreme northern edge of the geographic range, and as such, recruitment may be low and inconsistent. Reasonably high levels of PSP have been identified with this clam, but have been mainly confined to the viscera. Current regulations of the Department of Environmental Conservation prohibit the sale of unprocessed clams, and the disposal of waste portions of the clam can only be accomplished in a prescribed manner. These factors result in a necessarily close working relationship between the Department of Fish and Game staffs relative to harvest locations and rates of harvest. Each individual delivered lot must be certified free of PSP prior to marketing. These conditions also necessitate a close working relationship between industry representatives and the State agencies. Prior to 1985 a few geoducks were test marketed or sold for bait. Starting in 1985, three State

grants were used to find and assess commercial beds in the Ketchikan, Petersburg-Wrangell, and Sitka management areas. A number of potential commercial beds were located. Procedures for testing and certifying the product for human consumption were established. Harvestable biomass was estimated for the most promising beds. As a result, three beds in the vicinity of Noyes Island were certified for harvesting. Finally, two processors were certified for processing.

In late 1985 the initial permit was issued for the commercial harvest of geoduck clams. This harvest was conducted under a management plan developed to control the development of this fishery, and to prevent the depletion of the beds in question. In this first season, 1985/86, 154,582 pounds were harvested of the 300,000 pound five year quota. During the 1986/87 season, only 28,000 pounds were harvested. This drop in harvest was due more to poor marketing conditions and high operational costs rather than lack of product.

Management goals in the geoduck fishery are to provide for low exploitation rates for this long-lived species with low recruitment rates. Harvests are restricted to beds which have been surveyed and for which biomass estimates are available. The fishery is monitored through the miscellaneous vessel registration/harvest permit system. Some data is also collected from the fishery as time and opportunities permit.

### Sea Urchins

Sea urchins are found in the shallow waters of many portions of Southeast Alaska. Two species have drawn the interest of commercial operators, the green sea urchin, (*Strongylocentrotus drobachiensis*), and the red sea urchin, (*S. franciscanus*). Information to date indicates that the red sea urchin is the most abundant and more widely distributed. However, in some markets the green sea urchin, which is the smaller of the two, is preferred. From 1981 through 1983 small quantities of sea urchin roe were test marketed in Japan.

In 1984 the first significant harvest occurred in the Ketchikan area with red sea urchins comprising the major portion of the harvest. In 1984, approximately 61,650 pounds were harvested. In 1985, the harvest climbed to 125,973 pounds. In 1986, the harvest increased dramatically to 282,384 lbs. In 1987, the catch rose to 652,965 pounds. The catch in 1987 was inflated by extension of the fishery through the summer months to monitor gonadal development. It is unlikely that another summer fishery will be necessary again. The effort level peaked this year at thirty-six harvesters. In recent years, different processors have been involved each year with varying success. Roe percentages have fluctuated greatly with the outer districts on the west coast of Prince of Wales Island maintaining a slightly higher level of roe maturity. Ex-vessel price has been quite variable, mainly ranging between \$.10 to \$.18 per pound, depending on roe maturity.

The harvest of green sea urchins has been minimal in the Ketchikan area. This is due to the sporadic distribution and low population levels found so far in the area.

#### Sea Cucumbers

The harvest of sea cucumber, (*Parastichopus californicus*), has been sporadic and minimal prior to 1987 in the Ketchikan area. This fishery continues to be managed by stipulations in the miscellaneous registration and permit forms.

#### Octopus

Octopus, mainly *Octopus dofleini*, has been harvested in Southeast Alaska at minimal levels mainly as incidental catch in the shrimp pot fishery. Since 1976, octopus landings have ranged between 324 and 4,000 pounds, except for a

slightly higher harvest in 1981 when the harvest was near 6,100 pounds. Octopus has mainly been sold as bait in the longline fisheries. Ex-vessel price is around \$1.25 per pound.

### Squid

The commercial interest in squid, probably *Loligo opalescens*, has been very minimal and sporadic. There has been some interest in the use of purse seine gear for harvesting stocks on the west coast of Prince of Wales Island where they have been observed in shallower water in the spring. Only minor, if any harvest has occurred in this fishery. No permits for mechanical jigging machines, commonly used in other squid fisheries, have been issued in the Ketchikan area recently.

### SEASON SUMMARY

#### Abalone

The 1987/88 abalone season opened on October 1, 1987, in all fishing districts. The fishery in District 13 was closed by Emergency Order (1-M-23-87) on November 5 after a seasonal harvest of 10,406 pounds, which exceeded the guideline harvest level of 8,000 pounds. Major effort in the fishery occurred in October, during which 9,569 pounds were landed. Six landings were reported. The average ex-vessel price was \$3.02 per pound.

The fishery in all other districts was closed on October 22, 1987 by Emergency Order (1-M-22-87) based on projections of harvest levels through that date. The fishery in these districts produced a harvest of 57,209 pounds.

Districts 3 and 4 provided the major portion of this harvest. District 5 landings were 3,769 pounds, down from the record levels harvested there last season. Seventy-three landings by 31 permit-holders were reported from this fishery. The average ex-vessel price was \$4.75 per pound.

The average shell length of four samples taken during 1987 was 104.52 mm and the average whole abalone per pound was 3.12. Compared to past seasons, these measurements suggest a decreasing average size to the commercial catch.

No surveys were conducted on the abalone grounds by the Department in 1987.

### Scallops

During 1987 the scallop dredge fishery was limited to fewer than three vessels operating off the Yakutat coast in Statistical Area D. This continues a recent season pattern of low effort by very few vessels in this fishery. Research assessment programs are not in place to obtain more detailed information concerning this resource. Although specific catches cannot be reported, they are considered significant.

### Geoduck

In January, 1988, a new area, Vallenar Bay, was opened for the commercial harvest of geoducks, with a guideline harvest level of 100,000 to 125,000 pounds. Through mid-March, approximately 45,000 pounds have been harvested in this fishery by four separate divers. The average length of shell was 149.2 mm and the average whole weight was 2.93 pounds per geoduck. Recovery varied from 49 to 51 percent meat yield. The sample size was 30 animals. Vallenar Bay is one of four sub-areas located on the west coast of Gravina Island. The management of this fishery utilizes area rotation with one of

four sub-areas being opened each year, each having a two percent harvest rate. Harvesters are required to maintain a log book on a daily basis. Primary information gathered is amount and location of harvest, plus general comments on density levels observed.

No harvest has occurred in the Noyes Island fishery during the 1987-88 winter season.

Due to the danger of possible Paralytic Shellfish Poisoning (PSP) and the lack of a program which certifies beaches in Southeast Alaska, a sample from each landing in either area has to be tested for the presence of the PSP toxin prior to product sale. In the past this testing requirement has limited the processor to a frozen product. Recently, quicker testing has allowed the possibility of marketing an eviscerated, fresh product. Currently, due to the PSP problem, the Department of Environmental Conservation does not permit the sale of live geoducks.

Recently, one company in Ketchikan has been interested in trying to market geoducks in the bait market. If this venture is successful, it represents a competitive use of a biologically limited amount of product and may change the value of the product to the fishermen. Currently, neck meat, an essential ingredient in mirugai sushi, has been selling in Japan at between \$10.00 to \$12.00 per pound, depending on the grade. Bait sold locally commands a much lower price per pound.

Ex-vessel price to the diver is presently \$.30 per pound.

### Sea Urchins

During the 1987-88 winter period, small amounts of red sea urchins, (*Strongylocentrotus franciscanus*), were harvested only in the Blank Inlet area in early October. Lack of processor interest, rather than resource availability, ended the fishery for the season shortly thereafter.

Management techniques for red sea urchins include area rotation, restricting harvests to only animals with test diameters between 3.0 to 4.5 inches, and an annual season from October 1 through April 30.

The use of area rotation protects localized stocks near population centers from being rapidly depleted and ensures at least one area close to town is open each year to the local day fleet. The rotational period is three years. Near Ketchikan, the rotational areas are Vallenar Bay, the Dall Head area, and Blank Inlet. On the west coast of Prince of Wales Island the rotational areas are statistical areas 103-50, 103-60, and 103-70. The areas which were open during the 1987/88 season were Blanket Inlet and statistical area 103-50. The amount of area open was a reduction from the 1986/87 season, mainly due to limited staff time and budget and the attention to more traditional winter fisheries.

The size limit was developed to ensure product quality and conservation of the resource. The industry has mainly been interested in the product obtained from the urchins in this size range. Moreover, a review of the biological information available indicates larger urchins provide a protective spine canopy for smaller size urchins in the population. Urchins smaller than the lower size range are left for future recruitment into the fishery.

The open season coincides with the period of optimum roe quality. Closed periods protect stocks during sensitive reproduction and settlement stages.

Currently, there is no management plan developed for green sea urchins, (*S. droebachiensis*). During the 1987/88 season only one sample permit for 1,000 pounds was issued. The low densities and scattered distribution of green urchins near Ketchikan, rather than lack of processor interest, has limited development of this fishery.



## Sea Cucumbers

In May 1987, an experimental fishery for the sea cucumber, *Parastichopus californicus*, was initiated in southern Southeast Alaska, near Ketchikan. As of January, 1988, approximately 131,000 sea cucumbers were harvested from three separate areas by sixteen separate harvesters. The fishery initially started in Vallenar Bay in May and continued through October. In early November, Moira Sound, on the east coast of Prince of Wales Island, was opened due to a decline in the harvest success in Vallenar Bay and to determine the availability of sea cucumbers in a new area. The decline in densities in Vallenar Bay is thought to have occurred due to seasonal fluctuations in population levels rather than overharvesting. The location of Moira Sound forced the fleet to commute across the often stormy Clarence Strait. To alleviate this situation and provide alternate fishing areas, a portion of Carroll Inlet, north of the latitude of Brunn Point and south of the latitude of Island Point, was opened for harvesting in early December. Due to processor problems rather than resource availability, the fishery ended in early January.

Appropriate harvest levels are obtained by applying a known average density value (0.69 cucumber/m<sup>2</sup>), obtained from Vallenar Bay, to the amount of area between the depths of 0 to 60 feet in a given location and harvesting at a maximum level of 5 %. Each harvester is required to maintain a logbook noting the amount, location, depth, and date of harvest, plus general comments on densities and substrate habitat observed. The fishery is considered experimental and additional biological information needs to be obtained to responsibly manage it. A good quality and size of sea cucumber was obtained from all three areas in this fishery. The raw product was eviscerated, then shipped out of state, mainly by air, to a processing plant in Washington State. The ex-vessel price to the diver has averaged around ten cents per sea cucumber or eight dollars per five gallon bucket.

## Octopus

During 1987, approximately 17,262 pounds of octopus were landed, mostly as incidental catch in the shrimp pot fishery. However, an interest in actually targeting on octopus with various forms of pots continues to grow. The main species harvested is *Octopus dofleini*, which is less desirable than some other species for the Japanese food market. This is likely to constrain the development of this fishery to bait products. There is no current management plan developed for this fishery.

## Squid

There has been no harvesting of squid during the 1987-88 winter season.

## FUTURE SEASONAL PROJECTIONS

### Abalone

Adequate research information is not available concerning this species. Based upon the existing information and developments within the commercial fishery, it is estimated that abalone fisheries in the near future will occur in a similar fashion to those during the past few seasons. It is altogether likely that the recovery of abalone stocks to pre-1978 levels will take a considerable time period. It is also possible that the expanding sea otter population will not allow the recovery of abalone stocks in areas where both occur. If sea otters continue to expand their range into important abalone producing areas the quantity of abalone available for commercial harvest will decline.

The Commercial Fisheries Entry Commission has received petitions to limit the abalone fishery. The petition assumes that effort will increase with continuing high market value for this species.

### Scallops

Recent information reflecting stock conditions in this fishery is completely lacking, and it is doubtful that information from the commercial fishery is sufficient to provide insight. It appears that beds may be depressed from historic high levels, and that annual harvests in the recent range of 50,000 to 150,000 pounds of meats may be expected during the next few years.

### Geoducks

Currently no new geoduck areas have been identified or surveyed. Budget constraints and limited staff time has not allowed Department personnel to explore new areas for possible fishery potential. The Department has received requests for surveys of the Biorka Island beds for future harvest sites.

In the Noyes Island area, approximately 125,000 pounds is left of the 300,000 pound guideline harvest level which is valid until 1990. No harvest has occurred yet during this present winter season.

In the Gravina Island area, another sub-area on the west side of the island will be open for harvest on October 1, 1988. The guideline harvest level is expected to be similar to the one currently established for the present sub-area, namely 100,000 to 125,000 pounds.

The potential for entry of a large-scale operation with little advance warning continues to be a source of concern. Present management strategies

would be stressed to provide the amount of harvestable product in a conservative manner outlined in the present management plan. Present funding levels cannot provide both the resource protection necessary for a continuing fishery on this long-lived species with low recruitment rates and a large-scale fishery with high annual harvest demands.

Coordination with the Alaska Department of Environmental Conservation will continue in order to monitor the harvest for the possible occurrence of paralytic shellfish poison (PSP).

### Sea Urchins

Currently no funds have been allocated for sea urchin work in Southeast Alaska. Interest has been expressed by an outside company, based in Washington State, in harvesting red sea urchins on the west coast of Prince of Wales Island. Recent correspondence has indicated the processor has the capacity to harvest 25,000 pounds per day. Biological information on local stocks is minimal. Size frequency and population studies need to be conducted to prevent overharvesting.

### Sea Cucumbers

This fishery is still considered experimental. Additional information needs to be obtained to determine if it is a viable fishery. A few small areas may be opened in the future to gather additional information on local stocks. A management plan has yet to be developed for this fishery. Annual seasons, area rotation and harvest quotas are management techniques which may be employed to ensure the continuation of local stocks. There is an immediate need to conduct density studies by substrate habitat and also by time of year. Current information is limited on sea cucumbers. They are thought to have very low and sporadic recruitment rates.

## Octopus

A growing interest has been recently observed in this fishery in the Ketchikan area. Past studies on octopus have suggested local densities are too low to support an actual fishery. Additional information needs to be obtained before this can actually be verified. Introduction of new harvest techniques may change the current outlook on this fishery. Current harvest has been viewed as mainly an incidental catch to other fisheries. Information on local stocks is minimal.

## Squid

Current biological information on local stocks is sporadic and minimal. Likewise, interest in this fishery has varied annually. No funding for studies on this resource have been identified for the immediate future.

Table 1. Statistical Area A (Southeast Alaska) historic abalone, harvests in pounds by management area, 1963 to present.

| Year              | Ketchikan<br>Districts<br>(1-4) | Sitka<br>Districts<br>(13, 9A) | Petersburg<br>Districts<br>(5-8, 9B 10) | Juneau<br>Districts<br>(11, 12, 14-16) | Total   |
|-------------------|---------------------------------|--------------------------------|---|--|---------|
| 1964              |                                 | 3,000                          |   |  | 3,000   |
| 1965              |                                 | 1,000                          |   |  | 1,000   |
| 1966              | 3,000                           |                                |   |  | 3,000   |
| 1967              | 6,511                           |                                |   |  | 6,511   |
| 1968              |                                 |                                |   |  |         |
| 1969              |                                 |                                |   |  |         |
| 1970              |                                 | 1,100                          |   |  | 1,100   |
| 1971              |                                 | 923                            |   |  | 923     |
| 1972              |                                 | 2,610                          |   |  | 2,610   |
| 1973              | 144                             | 2,669                          |   |  | 2,813   |
| 1974              |                                 | 16,339                         |   |  | 16,339  |
| 1975              |                                 | 8,497                          |   |  | 8,497   |
| 1976              | 55                              | 546                            |   |  | 601     |
| 1977              | 955                             | 12,939                         |   |  | 13,894  |
| 1978              | 131,128                         | 50,167                         |   |  | 181,295 |
| 1979              | 286,266                         | 67,671                         | 3,134                                   | 298                                    | 357,369 |
| 1980              | 229,644                         | 14,182                         | 3,362                                   | 0                                      | 247,188 |
| 1981              | 337,481                         | 30,919                         | 824                                     | 0                                      | 369,224 |
| 1982              | 96,968                          | 12,826                         | 3,490                                   | 0                                      | 113,284 |
| 1983              | 37,499                          | 8,735                          | 570                                     | 0                                      | 46,804  |
| 1984              | 94,867                          | 8,459                          | 13,917                                  | 0                                      | 117,243 |
| 1985              | 60,223                          | 8,827                          | 6,946                                   | 0                                      | 75,996  |
| 1986              | 37,909                          | 6,842                          | 9,495                                   | 0                                      | 54,246  |
| 1987 <sup>1</sup> | 53,440                          | 10,406                         | 6,769                                   | 0                                      | 67,615  |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 2. Statistical Area A (Southeast Alaska) abalone, seasonal commercial harvests in round pounds (landings) by district, 1977/78 to present.

| Season               | Districts     |              |                 |                  |               |              |                 |            |            | Total            |
|----------------------|---------------|--------------|-----------------|------------------|---------------|--------------|-----------------|------------|------------|------------------|
|                      | 1             | 2            | 3               | 4                | 5             | 9            | 13              | 14         | 16         |                  |
| 1977/78              | 133<br>(1)    |              | 26,911<br>(38)  | 94,504<br>(42)   |               |              | 41,482<br>(163) | 148<br>(3) |            | 163,178<br>(247) |
| 1978/79              | 35<br>(1)     | 160<br>(2)   | 51,151<br>(5)   | 152,823<br>(142) | 3,134<br>(2)  |              | 61,045<br>(178) | 148<br>(3) | 171<br>(1) | 268,667<br>(364) |
| 1979/80              |               | 3,807<br>(7) | 102,946<br>(53) | 129,743<br>(66)  |               | 4,590<br>(3) | 32,684<br>(126) |            |            | 273,770<br>(255) |
| 1980/81              | 15<br>(1)     | 1,355<br>(1) | 111,058<br>(84) | 147,242<br>(120) | 824<br>(5)    |              | 18,619<br>(76)  |            |            | 279,113<br>(287) |
| 1981/82              | 0             | 0            | 68,049<br>(69)  | 87,159<br>(74)   | 0             | 0            | 16,821<br>(13)  | 0          | 0          | 172,029<br>(156) |
| 1982/83              | 98<br>(1)     | 0            | 29,693<br>(33)  | 67,177<br>(82)   | 3,490<br>(4)  | 0            | 12,826<br>(14)  | 0          | 0          | 113,284<br>(134) |
| 1983/84              | 2,565<br>(11) | 0            | 67,336<br>(46)  | 39,506<br>(40)   | 7,601<br>(12) | 0            | 9,922<br>(19)   | 0          | 0          | 126,950<br>(128) |
| 1984/85              | 2,745<br>(8)  | 55<br>(1)    | 23,553<br>(38)  | 23,511<br>(37)   | 7,548<br>(3)  | 0            | 10,864<br>(13)  | 0          | 0          | 68,276<br>(100)  |
| 1985/86              | 0             | 0            | 10,317<br>(15)  | 16,216<br>(12)   | 4,836<br>(4)  | 1,448<br>(4) | 7,720<br>(2)    | 0          | 0          | 40,537<br>(37)   |
| 1986/87              | 60<br>(1)     | 0            | 19,417<br>(19)  | 18,432<br>(22)   | 9,495<br>(13) | 0            | 7,400<br>(11)   | 0          | 0          | 54,804<br>(66)   |
| 1987/88 <sup>1</sup> | 0             | 449<br>(5)   | 26,000<br>(30)  | 26,991<br>(46)   | 3,769<br>(8)  | 0            | 10,406<br>(16)  | 0          | 0          | 67,615<br>(105)  |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 3. Statistical Area A (Southeast Alaska) 1986/87 and 1987/88 seasons harvest statistics of pinto abalone, in pounds and landings by district and month.

| 1986/87              |            |          |          |          |            |
|----------------------|------------|----------|----------|----------|------------|
| District             | October    | November | December | February | Total      |
| 1                    | 60(1)      |          |          |          | 60(1)      |
| 3                    | 19,417(19) |          |          |          | 19,417(19) |
| 4                    | 18,432(22) |          |          |          | 18,432(22) |
| 5                    | 9,495(13)  |          |          |          | 9,495(13)  |
| 13                   | 178(6)     | 244(1)   | 6,420(2) | 558(2)   | 7,400(11)  |
| Total Pounds         | 32,817     | 545      | 7,175    |          | 40,537     |
| Total Landings       | (35)       | (1)      | (1)      |          | (37)       |
| 1987/88 <sup>1</sup> |            |          |          |          |            |
| District             | October    | November |          |          | Total      |
| 2                    | 449 (5)    |          |          |          | 449 (5)    |
| 3                    | 26,000(30) |          |          |          | 26,000(30) |
| 4                    | 26,991(46) |          |          |          | 26,991(46) |
| 5                    | 3,769 (8)  |          |          |          | 3,769 (8)  |
| 13                   | 9,569(10)  | 837 (1)  |          |          | 10,406(16) |
| Total Pounds         | 66,778     | 837      |          |          | 67,615     |
| Total Landings       | (99)       | (6)      |          |          | (105)      |

<sup>1</sup> Most recent year's data should be considered preliminary.



Table 4. Statistical Area A (Southeast Alaska) historic abalone fishery statistics.

| Season               | 1977/78  | 1978/79  | 1979/80  | 1980/81  | 1981/82  | 1982/83  | 1983/84 | 1984/85 | 1985/86 | 1986/87 | 1987/88 <sup>1</sup> |
|----------------------|----------|----------|----------|----------|----------|----------|---------|---------|---------|---------|----------------------|
| Harvest<br>in pounds | 163,178  | 268,667  | 273,770  | 279,113  | 172,029  | 113,284  | 126,942 | 68,276  | 40,537  | 54,804  | 67,615               |
| Number<br>Landings   | 247      | 364      | 255      | 287      | 156      | 134      | 117     | 100     | 37      | 66      | 105                  |
| Months<br>Fishing    | 12       | 12       | 9.5      | 9        | 2.5      | 1.3      | 4.5     | 5.1     | 2.6     | 4.8     | 1.2                  |
| Weeks<br>Fishing     | 52       | 52       | 38       | 36       | 10       | 5        | 17.8    | 21.0    | 8.6     | 19.3    | 5.0                  |
| Pounds/<br>Landings  | 660.6    | 746.3    | 1,073.6  | 972.5    | 1,102.8  | 845.4    | 1,085   | 683     | 1,096   | 830     | 644                  |
| Pounds/<br>Month     | 13,598.2 | 22,388.9 | 28,817.9 | 31,012.6 | 68,811.6 | 87,141.5 | 28,029  | 13,384  | 15,591  | 11,418  | 56,346               |
| Pounds/<br>Week      | 3,138.0  | 5,166.7  | 7,204.5  | 7,753.1  | 17,202.9 | 22,656.8 | 7,132   | 3,251   | 4,714   | 2,840   | 13,523               |
| Landings/<br>Monthly | 20.6     | 30.3     | 26.8     | 31.9     | 62.4     | 103.1    | 26.0    | 19.6    | 14.2    | 13.8    | 87.5                 |
| Landings/<br>Weekly  | 4.8      | 7.0      | 6.7      | 8.0      | 15.6     | 26.8     | 6.6     | 4.8     | 4.3     | 3.4     | 21.0                 |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 5. Statistical Area A (Southeast Alaska) abalone, summary of commercial dockside sampling data.

| Season  | No. of Samples | Sample Size | Average Length(mm) | Range  | Number Abalone Per Pound |
|---------|----------------|-------------|--------------------|--------|--------------------------|
| 1977/78 | 4              | 493         | 98.02              | 81-126 | 2.86                     |
| 1978/79 | 7              | 965         | 100.22             | 80-136 | Not sampled              |
| 1979/80 | 18             | 2,026       | 106.06             | 84-143 | 2.51                     |
| 1980/81 | 10             | 1,311       | 103.91             | 90-130 | 2.78                     |
| 1981/82 | 7              | 785         | 106.91             | 83-136 | 2.60                     |
| 1982/83 | 6              | 689         | 103.01             | 89-132 | 2.74                     |
| 1983/84 | 13             | 971         | 106.46             | 92-138 | 2.90                     |
| 1984/85 | 5              | 608         | 106.35             | 92-136 | 2.79                     |
| 1985/86 | 5              | 433         | 100.97             | 92-137 | 3.08                     |
| 1986/87 | 4              | 502         | 103.61             | 89-137 | 3.04                     |
| 1987/88 | 4              | 730         | 104.52             | 90-137 | 3.12                     |

Table 6. Comparative length frequencies from research sites in Districts 3 and 4 (outside Prince of Wales Island) in areas open to commercial exploitation. Data developed by Robert Larson.<sup>1</sup>

| Year of Sample                    | 1979    | 1980        | 1981  |
|-----------------------------------|---------|-------------|-------|
| No. sites                         | 7       | 18          | 54    |
| Sample size                       | 1,304   | 1,230       | 2,848 |
| Ab.'s collected per diving minute | Unknown | Approx. 4.0 | 6.0   |
| Percent $\leq$ 3 inches           | 17      | 28          | 57    |
| Percent $>$ 3 inches but $<$ 3.75 | 31      | 39          | 29    |
| Percent $\geq$ 3.75               | 52      | 32          | 14    |
| Average Length                    | 3.7     | 3.4         | 2.9   |

<sup>1</sup> No studies done in 1982 - 1987.

Table 7. Statistical Area D (Yakutat) historic commercial catch and effort of weathervane scallops.

| Year              | Number of Vessels               | Catch in Pounds | Number of Landings | Average Catch Per Landing | Average Catch Per Vessel |
|-------------------|---------------------------------|-----------------|--------------------|---------------------------|--------------------------|
| 1968              | 11                              | 927,795         | 34                 | 37,112                    | 84,345                   |
| 1969              | 14                              | 837,087         | 59                 | 14,188                    | 59,792                   |
| 1970              | 2                               | 22,726          | 2                  | 11,363                    | 11,363                   |
| 1971              | 3                               | 84,948          | 10                 | 8,495                     | 28,316                   |
| 1972              | 4                               | 128,241         | 6                  | 21,373                    | 32,060                   |
| 1973              | 4                               | 173,700         | 4                  | 43,425                    | 43,425                   |
| 1974              | 2                               | 356,493         | 15                 | 23,766                    | 178,246                  |
| 1975              | 4                               | 139,022         | 12                 | 11,585                    | 37,455                   |
| 1976              | 2                               | 189,543         | 15                 | 12,636                    | 94,771                   |
| 1977              | 2                               | 22,121          | 3                  | 7,374                     | 11,060                   |
| 1978              | ----- NO FISHING OCCURRED ----- |                 |                    |                           |                          |
| 1979              | 2                               | 20,146          | 2                  | 10,073                    | 10,073                   |
| 1980              | 6                               | 261,517         | 22                 | 11,887                    | 43,586                   |
| 1981              | 11                              | 445,934         | 36                 | 12,387                    | 40,539                   |
| 1982              | 7                               | 210,554         | 30                 | 7,018                     | 30,079                   |
| 1983              | 1                               | 800             | 1                  | 800                       | 800                      |
| 1984              | 2                               | 74,010          | 15                 | 4,934                     | 37,005                   |
| 1985              | 4                               | 21,836          | 11                 | 1,985                     | 5,459                    |
| 1986              | 2                               | 76,179          | 18                 | 4,232                     | 38,090                   |
| 1987 <sup>1</sup> | 1                               | 73,582          | 14                 | 5,256                     | 73,582                   |

<sup>1</sup> Most recent year's data should be considered preliminary.

Table 8. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) commercial catch (landings) of miscellaneous species.

| Year              | Octopus<br>870 | Sea<br>Urchins<br>896 | Sea<br>Cucumbers<br>895 | Snails<br>890 | Geoducks<br>815 | Razor<br>Clams<br>830 | Squid<br>875 | Coral<br>899 |
|-------------------|----------------|-----------------------|-------------------------|---------------|-----------------|-----------------------|--------------|--------------|
| 1976              | 1,525(20)      |                       |                         |               |                 |                       |              |              |
| 1977              | 390 (8)        |                       |                         |               |                 |                       |              |              |
| 1978              | 1,135(15)      |                       |                         | 426(1)        |                 | 1,064(2)              |              | 1,510(2)     |
| 1979              | 1,362(18)      |                       |                         |               |                 |                       | 52(1)        | 225(1)       |
| 1980              | 3,581(36)      |                       |                         |               | 300(1)          |                       |              |              |
| 1981              | 6,107(62)      | 1,584 (2)             |                         |               |                 |                       |              |              |
| 1982              | 2,274(42)      | 550 (2)               |                         |               |                 |                       |              |              |
| 1983              | 3,983 (3)      | 1,870 (1)             | 256 (1)                 | 128(2)        | 266(1)          |                       |              |              |
| 1984              | 2,184(10)      | 61,650 (29)           | 290 (4)                 | 471(6)        | 1,066(2)        | 35(1)                 |              |              |
| 1985              | 575 (4)        | 125,973 (48)          |                         |               | 18,917(4)       |                       |              |              |
| 1986              | 342 (3)        | 282,384(153)          |                         |               | 130,961(2)      |                       |              |              |
| 1987 <sup>1</sup> | 17,262(96)     | 652,965(332)          | 80,559(91)              |               | 28,191(9)       |                       |              |              |

<sup>1</sup> Most recent year's data should be considered preliminary.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

**If you believe you have been discriminated against in any program, activity, or facility please write:**

ADF&G ADA Coordinator, P.O. Box 115526, Juneau AK 99811-5526

U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, Washington DC 20240

**The department's ADA Coordinator can be reached via phone at the following numbers:**

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648, (Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

**For information on alternative formats and questions on this publication, please contact:**

ADF&G, Division of Commercial Fisheries, P.O. Box 115526, Juneau AK 99811-5526 (907)465-4210.